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VOLUME NO. 1

EXPLANATORY NOTES

OF

INCREASES, DECREASES, AND CHANGES IN LANGUAGE

IN THE BUDGET FOR THE

DEPARTMENT OF AGRICULTURE

FOR THE

FISCAL YEAR ENDING JUNE 30, 1938

AND OF

WORK DONE UNDER EACH OF THE APPROPRIATION ITEMS

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Includes the following Bureaus and Offices:

	Pages
Statement, Budget Estimates for Fiscal Year 1938 Compared with Appropriations for 1937	VI - VIII
Office of the Secretary	1 - 17
Office of the Solicitor	18 - 19
Office of Information	20 - 32
Library	33 - 34
Office of Experiment Stations	35 - 49
Special Research Fund, Department of Agriculture	50 - 53
Extension Service	54 - 79
Weather Bureau	80 - 96
Bureau of Animal Industry	97 - 127
Bureau of Dairy Industry	128 - 140
Bureau of Plant Industry	141 - 196

I N D E X

(Volume 1)

	Pages
Statement, Budget Estimates for Fiscal Year 1938 Compared with Appropriations for 1937	VI - VIII
OFFICE OF THE SECRETARY:	
Salaries, Office of the Secretary	1 - 7
Quarters, heat, and light allowance authorizations	7 - 10
Miscellaneous expenses, Department of Agriculture:	
Regular appropriation	11 - 13
Emergency funds	13
Rent of buildings in the District of Columbia	13 - 15
Emergency funds	16
Passenger-carrying vehicles	17
OFFICE OF THE SOLICITOR:	
Salaries and expenses	18 - 19
Emergency funds	19
OFFICE OF INFORMATION:	
Salaries and expenses:	
Regular appropriation	20 - 24
Emergency funds	24
Printing and binding:	
Regular appropriation	24 - 32
Emergency funds	32
Emergency funds	32
LIBRARY:	
Salaries and expenses	33 - 34
Emergency funds	34
OFFICE OF EXPERIMENT STATIONS:	
Payments to States, Hawaii, Alaska, and Puerto Rico for agricultural experiment stations	35 - 39
Hatch Act	36
Adams Act	36
Purnell Act	36 - 37
Hawaii station Act	37
Alaska station Acts	37
Puerto Rico station Act	37
Bankhead-Jones Act	37 - 39
Salaries and expenses:	
Administration of grants to States and coordination of research	40 - 43
Insular experiment stations	43 - 47
Hawaii station	44
Puerto Rico station	44 - 47
Emergency funds	48 - 49
Passenger-carrying vehicles	49

	Pages
SPECIAL RESEARCH FUND, DEPARTMENT OF AGRICULTURE:	50
Administration of payments to States under Title I, Bankhead-Jones Act	51 - 52
Special research projects, Department of Agriculture	52
Special research laboratories in major agricultural regions	52 - 53
Passenger-carrying vehicles	53
EXTENSION SERVICE:	
Payments to States, Hawaii, Alaska, and Puerto Rico for agricultural extension work	54 - 65
Supplementary cooperative extension work (supplementary Smith-Lever appropriation)	58 - 59
Capper-Ketcham extension work	59 - 60
Extension work, section 21, Bankhead-Jones Act	60 - 61
Alaska	62 - 63
Additional cooperative extension work	63 - 64
Emergency funds	64 - 65
Salaries and expenses:	
General administrative expenses	65 - 66
Farmers' cooperative demonstration work:	
Regular appropriation	66 - 67
Emergency funds	68 - 72
Motion pictures	72
Agricultural exhibits at fairs:	
Regular appropriation	73
California Pacific International Exposition	74
Texas Centennial Exposition	74
Great Lakes Exposition	74
Emergency funds	75
Cooperative farm forestry	75 - 76
Cooperative agricultural extension work	77
Emergency funds	78 - 79
WEATHER BUREAU:	
Salaries and expenses:	
General administrative expenses	80 - 81
General weather service and research	81 - 90
Aerology	90 - 95
Emergency funds	96
BUREAU OF ANIMAL INDUSTRY:	
Salaries and expenses:	
Preamble	97
General administrative expenses	97 - 98
Animal husbandry	98 - 101
Diseases of animals:	
Regular appropriation	101 - 108
Emergency funds	108 - 109

	Pages
BUREAU OF ANIMAL INDUSTRY - Continued.	
Salaries and expenses - continued.	
Eradicating tuberculosis:	
Regular appropriation	109 - 111
Emergency funds	111
Eradicating cattle ticks:	
Regular appropriation	112
Emergency funds	112
Eradicating dourine	113
Hog cholera control	113
Inspection and quarantine	114 - 116
Meat inspection	117 - 118
Virus-Serum-Toxin Act	119
Marketing agreements with respect to hog cholera virus and serum	119 - 120
Packers and Stockyards Act	120 - 121
Eradication of foot-and-mouth and other contagious diseases of animals	121 - 122
Emergency funds	122 - 126
Passenger-carrying vehicles	126 - 127
BUREAU OF DAIRY INDUSTRY:	
Salaries and expenses:	
General administrative expenses	128
Dairy investigations	128 - 140
Emergency funds	140
BUREAU OF PLANT INDUSTRY:	
Salaries and expenses:	
Limitation on cost of buildings	141
General administrative expenses	142
Arlington farm	142 - 143
Botany	143 - 145
Cereal crops and diseases	145 - 147
Cotton and other fiber crops and diseases	147 - 151
Drugs and related plants	151 - 152
Dry-land agriculture	152 - 154
Experimental greenhouse maintenance	154
Forage crops and diseases	154 - 158
Forest pathology	158 - 160
Fruit and vegetable crops and diseases	160 - 170
Genetics and biophysics	170 - 171
Mycology and disease survey	171 - 173
National arboretum	173 - 174
Nematology	174 - 176
Plant exploration and introduction	176 - 178
Plant nutrition	179 - 180
Rubber and other tropical plants	180 - 181
Seed investigations	181 - 183
Soil fertility investigations	183 - 185
Soil microbiology investigations	185 - 186

Pages

BUREAU OF PLANT INDUSTRY - Continued.
Salaries and expenses - continued.
Sugar-plant investigations..... 186 - 189
Tobacco investigations..... 189 - 191
Western irrigation agriculture..... 191 - 192
Emergency funds..... 192 - 195
Passenger-carrying vehicles..... 195 - 196

-oOo-

Project Statements

Following the custom of previous years, for the sake of simplicity and avoidance of confusion, "Project Statements" as shown in this book in general are limited to a breakdown of funds appropriated or allotted directly to the Department of Agriculture and do not include funds transferred from other Departments or establishments, although the latter are included in the Budget expenditure schedules under the items involved. The Project Statements printed in the formal Budget and reprinted in the Subcommittee Print include, in addition to the direct funds, projects dealing with funds transferred from other Departments -- for example, funds received from such agencies as the Navy Department or the Veterans' Administration, for the inspection of meats by the Bureau of Animal Industry, or the inspection of food and drug samples by the Food and Drug Administration. Where it is desired to examine a project statement which includes such transferred funds, therefore, reference should be made to the Project Statements in the Budget or to the Subcommittee Print.

DEPARTMENT OF AGRICULTURE

Budget Estimates for Fiscal Year 1938 Compared with Appropriations for 1937 (as of December 31, 1936)

Bureau and item	Appropriation, 1937	Budget estimate 1938 compared with appropriations, 1937	
		Total estimate, 1938	Increase (+) or decrease (-)
Ordinary Activities:			
Office of the Secretary	$608,519	$591,450	-$17,069
Office of the Solicitor	188,801	194,160	+ 5,359
Office of Information	1,217,532	1,254,130	+ 36,598
Library	103,800	105,420	+ 1,620
Office of Experiment Stations	231,046	231,046	- - -
Special Research Fund	800,000	1,200,000	+400,000
Extension Service	910,754	910,754	- - -
Weather Bureau	3,873,024	4,260,885	+387,861 (1)
Bureau of Animal Industry	10,063,963	10,363,098	+299,135
Bureau of Dairy Industry	697,094	723,995	+ 26,901
Bureau of Plant Industry	4,551,206	4,549,321	- 1,885
Forest Service	13,291,419	14,219,096	+927,677
Bureau of Chemistry and Soils	1,398,272	1,460,188	+ 61,916
Bureau of Entomology and Plant Quarantine	4,857,675	5,580,520	+722,845
Bureau of Biological Survey	1,781,539	1,944,155	+162,616
Bureau of Agricultural Engineering	438,269	468,269	+ 30,000
Bureau of Agricultural Economics	5,992,896	6,181,850	+188,954
Bureau of Home Economics	219,085	225,085	+ 6,000
Commodity Exchange Administration	196,500	590,000	+393,500
Food and Drug Administration	2,077,758	2,277,758	+200,000
Soil Conservation Service	24,869,265	25,000,000	+130,735
Beltsville Research Center	75,000	85,000	+ 10,000
Total, Ordinary activities	78,443,417	82,416,180	+3,972,763
Special Items:			
Acquisition of lands for national forests	2,500,000	2,500,000	- - -
Cooperative acquisition of lands for State forests	- - -	1,000,000	+1,000,000
Acquisition of land for migratory-bird refuges	36,185	36,185	- - -
Acquisition of lands for Upper Mississippi River Refuge	18,500	- - -	- 18,500
Migratory-bird conservation fund	425,000	425,000	- - -
Elimination of diseased cattle (Sec. 37, Act of August 24, 1935)	(2)	(2)	- - -
Construction of sugar laboratory, Houma, La.	- - -	99,921	+ 99,921
Screw worm control	460,000	- - -	-460,000
Grasshopper control	250,000	- - -	-250,000
Plains shelterbelt project	170,000	- - -	-170,000
Total, Special items	3,859,685	4,061,106	+201,421

(1) Includes $140,000 transferred from Department of Commerce.

(2) Unobligated balances of prior year appropriations in the amount of $24,364,000 for 1937 and $15,864,000 for 1938 available for this purpose.

Bureau and item	Appropriation, 1937	Budget estimate 1938 compared with appropriations, 1937	
		Total estimate, 1938	Increase (+) or decrease (-)
Receipts and Contributed Funds:			
Acquisition of lands in Uinta and Wasatch National Forests	$50,000	$50,000	- - -
Payments to States and Territories (National-forest fund)	995,891	1,100,000	+$104,109
Payments to school funds, Arizona and New Mexico (National-forest fund)	31,685	20,000	-11,685
Roads and trails for States (National-forest fund)	350,000	400,000	+50,000
Payments to counties under Migratory Bird Conservation Act	6,500	7,500	+ 1,000
Cooperative work, Forest Service (contributed funds)	2,000,000	1,000,000	-1,000,000
Total, Receipts and contributed funds	3,434,076	2,577,500	- 856,576
Payments to States (exclusive of road funds and receipt funds):			
Agricultural experiment stations	5,620,000	6,242,500	+ 622,500
Agricultural extension work	17,125,014	17,490,083	+ 365,069
Cooperative forest-fire prevention	1,655,007	1,655,007	- - -
Cooperative distribution of forest planting stock	70,579	70,579	- - -
Total, Payments to States, as above	24,470,600	25,458,169	+ 987,569
Total, all foregoing items	110,207,778	114,512,955	+4,305,177
Agricultural Adjustment Administration:			
Conservation and use of agricultural land resources, Dept. of Agriculture	(1)440,000,000	(2)440,000,000	- - -
Exportation and domestic consumption of agricultural commodities (sec. 32, Act of August 24, 1935)	109,139,621	120,000,000	+10,860,379
Total, Agricultural Adjustment Administration	549,139,621	560,000,000	+10,860,379
Total, exclusive of road funds	659,347,399	674,512,955	+15,165,556

(1) $30,000,000 additional made available for this purpose by transfer from other Agricultural Adjustment Administration funds.

(2) $60,000,000 additional made available for this purpose by transfer from other Agricultural Adjustment Administration funds.

Bureau and item	Appropriation, 1937	Budget estimate 1938 compared with appropriations, 1937	
		Total estimate, 1938	Increase (+) or decrease (-)
Road Funds (under General Public Works Estimates (1938) for work administered by the Department of Agriculture):			
Federal-aid highway system	$60,000,000	$150,000,000	+$90,000,000
Federal-aid secondary or feeder roads	- - -	5,000,000	+ 5,000,000
Elimination of grade crossings	- - -	10,000,000	+ 10,000,000
Public lands highways	- - -	2,500,000	+ 2,500,000
Forest roads and trails	8,000,000	14,000,000	+ 6,000,000
Total, road funds	68,000,000	181,500,000	+113,500,000
Grand total, Department of Agriculture .	727,347,399	856,012,955	+128,665,556

OFFICE OF THE SECRETARY

(a) SALARIES, OFFICE OF THE SECRETARY

Appropriation Act, 1937	$432,271
Allotment from "General Administrative Expenses", Forest Service (salary of telephone operator)	+1,500
Allotment to "General Administrative Expenses", Extension Service (salary of Director of Extension Work)	-9,000
Total available, 1937	424,771
Budget Estimate, 1938	452,700
Increase	27,929

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)	Increase
1. General administration (including offices of the Secretary, Under Secretary, and Assistant Secretary)	$62,491	$65,980	$71,580	+$5,600(1)
2. Personnel administration and service (including divisions of appointments, salary classification, and investigations)	81,006	90,640	102,460	+11,820(2)
3. Budget and finance administration and service (including divisions of accounts, estimates and reports, purchase, sales, and traffic, and bureau accounting service)	139,572	160,880	168,700	+7,820(3)
4. General operations (including housing, mails and files, telegraph and telephone, property, emergency-room, post office, labor force, etc.)	107,341	107,271	109,960	+2,689(4)
Unobligated balance	746	- - -	- - -	- - -
Total appropriation	391,156(a)	424,771	452,700	+27,929

(a) For 1936 includes allotment of $1,500 from "General Administrative Expenses", Forest Service; and excludes $9,000 allotted to "General Administrative Expenses", Extension Service, $178,401 allotted to "Salaries and Expenses", Office of the Solicitor, and $7,655 transferred to "Miscellaneous Expenses, Department of Agriculture." All these items either were transferred in the Agricultural Appropriation Act for 1937 or are transferred in the estimates for 1938.

INCREASES AND DECREASES

The increase of $27,929 for 1938 consists of:

(1) An increase of $5,600 for an administrative assistant to the Secretary of Agriculture. This increase is requested to provide more adequate assistance in connection with general supervision of the work of the Department. The services of an additional administrative assistant are urgently needed to conserve the time of the Secretary, the Under Secretary, and the Assistant Secretary to the greatest extent possible by conferring with the directors, bureau chiefs, Solicitor, and other Department officials in finding the solution to a host of administrative problems, and to confer with the Secretary only as necessary to obtain final decisions. The administrative assistant would also handle correspondence for the Secretary, and in behalf of the Secretary he would confer with officials of the executive Departments, of the Works Progress Administration, etc., to settle necessary details that are invariably involved when important administrative questions of the Department of Agriculture concern such agencies.

(2) An increase of $11,820 for additional assistance in the Office of Personnel. The Office of Personnel includes, in addition to the Director's immediate office, the Division of Appointments, the Division of Salary Classification, and the Division of Investigations. In this Office all recommendations for appointments or other personnel actions affecting the status of employees are considered and reviewed to determine their conformity with law and administrative policy prior to formal action thereon by the Secretary. In addition to matters directly affecting personnel, the Director is called upon to handle a large volume of business related to the general administration and operation of the Department. The increases requested for 1938 include:

(a) $5,600 for an assistant director of personnel. The growth of the Department and the scope and complexity of its operations makes it imperative that more adequate provision be made for the handling and supervision of the personnel work. Under regular appointment in the Department and engaged upon divers kinds and types of work there are more than 53,000 employees, who are scattered throughout the 48 States, the insular possessions of the United States, and foreign countries. The work has increased to such an extent that it is becoming increasingly difficult to keep it current, and the services of an administrative officer, competent and qualified to assume responsibility for making decisions on important personnel matters, are urgently needed. The assistant director will be associated with the Director in the direction of the activities of the several divisions comprising the Office of Personnel, will be required frequently to confer with the Secretary, chiefs of bureaus, and other Department officials, and will assume full responsibility for the administration of the personnel work of the Department in the absence of the Director.

(b) $6,220 for accident and injury prevention, including a safety engineer at $4,600 per annum and one clerk at $1,620 per annum. The services of these additional employees are required in connection with the President's accident and public safety program, to determine the conditions under which employee accidents occur, to devise means for eliminat-

ing hazards arising out of the operations of the Department, both as to the employees and the general public, to direct the installation of safety appliances, and to organize and develop a program of safety education adapted to conditions in the respective bureaus of the Department. The work contemplated will require the inspection of stations and operations in the field. An increase of $1,000 for travel expenses for this purpose is also requested under the appropriation for "Miscellaneous Expenses, Department of Agriculture."

(3) An increase of $7,820 for personnel in the Office of Budget and Finance. The Office of Budget and Finance includes the Division of Accounts, the Division of Estimates and Reports, the Division of Purchase, Sales, and Traffic, and the Bureau Accounting Service (which performs regular accounting work for a number of bureaus which maintain no bureau accounting office). The Office of Budget and Finance, in addition to its fiscal and accounting operations, performs a large volume of work related to general departmental operation and administration. The increases requested for 1938 consist of:

(a) $1,800 for an accountant-bookkeeper in the Bureau Accounting Service. This office serves as the internal accounting organization for the Office of the Secretary, Office of the Solicitor, Office of Information, Office of Experiment Stations, Extension Service, Bureau of Home Economics, and the Commodity Exchange Administration. The additional employee requested is urgently needed primarily to assist in handling the increased volume of work required in connection with the installation by the General Accounting Office of a new system of accounting for the Central Supply operations. The addition of general ledger accounts provides a more adequate control over the operations of the Central Supply Section, and the incidental large increase in detailed work has developed a situation which the present personnel is wholly unable to meet.

(b) $6,020 for additional assistance in the Division of Accounts. This Division maintains the general ledgers of the Department, receives and handles all warrants, transfers of funds, allotments, etc., clears the vouchers and collections from the Department to the Treasury and General Accounting Office, and prepares financial reports, cash withdrawal estimates, apportionments, etc., for the Treasury, the Budget Bureau, and other agencies. The increases requested include provision for urgently needed assistance, as follows:

$2,600 per annum to pay the salary of a highly qualified assistant, whose services are essential to determine currently, from data developed from bookkeeping and accounting operations, the amount required to be advanced to the Chief Disbursing Officer, Treasury Department, from each appropriation or fund of the Department to meet the payment of vouchers scheduled to him thereunder, and, on the basis of these requirements, to prepare for the certification of the Director of Finance and approval of the Secretary of Agriculture, the necessary requisitions for disbursing funds to be placed to the credit of the Chief Disbursing Officer; to determine, from current field disbursing reports and changes in requirements reported by bureau administrative officials and other variable factors, the amount to be transferred to each of the 19 regional disbursing offices and other depositary accounts from each appropriation and fund of the Department

necessary to meet the payment of field payrolls and other vouchers, and on the basis of these requirements to prepare the necessary transfer forms. The necessity for the creation of this position arises primarily out of the use by the various bureaus of the Department of the facilities for direct payment in the field made possible by the establishment during the past year of regional disbursing offices under the Treasury Department. The use of these offices, principally for local payment of field payrolls, has constantly increased since their establishment, and the additional burden placed upon the Division of Accounts in receiving, handling, examining, and adjusting this greatly increased number of accounts makes provision of funds for this position urgently necessary. Pending the availability of funds for the purpose, it has been absolutely necessary to employ a man for these duties, by detail from bureau rolls, but, as the use of the field disbursing offices has been shown to be of such great benefit that it should be permanently continued and extended to all bureaus having field organizations, it is desirable to provide for the salary of this man on the Secretary's roll.

$3,420 to provide for the salary of one accountant-bookkeeper at $1,800 and one clerk-bookkeeper at $1,620, whose services are urgently needed to handle additional work imposed on the Bookkeeping and Accounting Section of the Division of Accounts incident to the Department's field payroll system, which is constantly increasing by reason of the further use of the 19 regional disbursing offices by the various bureaus and offices of the Department. This involves the receiving, examining, and currently posting to the various additional ledger accounts the detailed information contained in approximately 250 separate monthly accounts current. Additional assistance is also required in carrying into effect regulations issued by the Comptroller General of the United States covering the resymbolization of appropriation and receipt accounts, and detailed accounting on all limitations prescribed thereunder. These data are now required to be furnished in statement form to the General Accounting Office in support of all transactions included in the monthly accounts current of all fiscal officers handling the accounts of the Department.

(4) An increase of $2,689 for additional assistance in the Division of Operation. This Division is responsible for the management of the buildings and other facilities occupied or used by the Department in the District of Columbia, including the telephone and telegraph services, the mails and files, the Department post office, motor transport service, engineering advice, emergency-room, building directory and information, labor force, and other service units, and for the personnel, financial, and budget work of the Office of the Secretary. The chief of the Division, as departmental real estate officer, reviews and passes upon applications by the several bureaus of the Department for the leasing of office, laboratory, storage, and other facilities and for the procurement of space in Federal buildings throughout the country. Additional assistance is urgently needed for the following purposes:

(a) $1,260 for an additional clerk for the Department Post Office. With the completion and occupancy of the final portions of the South Building, there will be placed in operation seven additional pneumatic mailing-tube stations, located one each on the six floors and basement of Wing 2 of the building, together with a similar number of pneumatic mailing tubes

in the central Department post office, to handle incoming, outgoing, and interbureau mail for the bureaus and offices to be assigned space in the new section of the building, as well as to provide tube service for the bureaus already occupying space in Wing 1 and for which no mailing-tube facilities are now available. There are now in operation 15 tube stations, one of which is located in the Administration Building, one each in the East and West Wings, and 12 on the various floors of Wings 4 and 6 of the South Building, together with 15 terminal tubes in the Department post office. The installation of 7 new tube stations in Wing 2, with a corresponding number of new tubes in the central station, will place a materially increased burden of work on the Post Office, involving not only the receiving, sorting, distributing, and dispatching of mail for the units to be located in the new portions of the South Building and for the bureaus already occupying space in Wing 1, but, in addition, a very great increase in the volume of inter-bureau and intra-bureau mail matter which will be handled when the new tubes are placed in operation. A recent survey indicated that the terminal post office station was handling approximately one carrier every 20 seconds, and it is estimated that the new tube installation will increase the number of carriers to be handled from 3 to 5 per minute. The post office staff is at present undermanned, and it is impossible to permit the assignment of the full time of a clerk to the operation of the tube terminals despite the fact that the volume of mail now handled is so great that one employee should be assigned to that work on a full-time basis. With the addition of the seven new tubes, it will be absolutely necessary to assign at least one employee to the exclusive operation of the terminal tube facilities in order that the mail may not be delayed in reaching its destination. The tube system has greatly expedited the handling of telegrams, as well as mail matter, and, unless all such material is handled promptly when deposited at the central pneumatic tube station, the Department will fail to derive the fullest benefit from the expensive equipment installation. In order to provide sufficient personnel to handle the increased volume of work incident to the inauguration of the new tube facilities, the services of at least one additional clerk are required.

(b) $1,440 for a clerk-stenographer for the Real Estate and Housing Section. This section handles matters concerning the leasing of space throughout the United States for the various bureaus of the Department, as well as the assignment of space in Federal buildings throughout the country where Government-owned space is available or proposed for the housing of departmental activities. The work involves the examination of bids, renewals of leases, and other actions affecting premises leased by the Department, as well as the preparation of numerous reports required to be made to the Section of Space Control of the Procurement Division concerning departmental leasing activities. The Department Real Estate Officer serves as contact officer with the National Park Service on matters affecting space in the District of Columbia and with the Procurement Division, Treasury Department, in connection with the leasing of quarters and the assignment of space for the Department of Agriculture in existing or proposed Federal buildings throughout the country. During the fiscal year 1936 the number of individual lease transactions handled increased approximately 40 percent over the preceding fiscal year, and there has been a correspondingly large increase in the work incident to space adjustments and assignments in Government-owned structures. The present staff, notwithstanding much overtime work, is unable to keep the work current, and the services of an additional clerk-stenographer are urgently needed to assist in handling the work.

(c) A decrease of $11 is proposed in order to round out, in even figures, the appropriation total under this appropriation.

CHANGES IN LANGUAGE

The following provisions, which are permanent legislation have been omitted:

> [Provided further, That hereafter funds available for field work in the Department of Agriculture shall be available for employment by contract or otherwise of men with equipment, boats, work animals, animal-drawn, and motor-propelled vehicles]

> [Provided further, That hereafter funds available for field work in the Department of Agriculture may be used for the purchase of arms and ammunition whenever the individual purchase does not exceed $50, and for individual purchases exceeding $50, when such arms and ammunition cannot advantageously be supplied by the Secretary of War pursuant to the Act of March 3, 1879 (20 Stat. 412)]

WORK UNDER THIS APPROPRIATION

General.--This appropriation provides salaries for employees of the Office of the Secretary of Agriculture, Under Secretary, Assistant Secretary, Office of Personnel, Office of Budget and Finance, and the Division of Operation,. including such activities as the appointment, classification, and investigations divisions, the finance and accounting divisions, the offices dealing with purchases, sales, and traffic, mail and files, telephone and telegraph, post office, emergency room, housing, building directory and information services, labor force, etc. This organization comprises the general administration and supervision of the work of the Department, as follows:

1. General Administration.--The Secretary, Under Secretary, Assistant Secretary, and their assistants, through the chiefs of the bureaus, supervise and control the activities of the Department as a whole, and formulate, establish, and carry out general policies affecting Agriculture in the broadest sense.

2. Personnel Administration and Service.--The Office of Personnel is in charge of the personnel work of the Department. This office unifies methods of procedure and applications of policy in regard to personnel; advises with the several bureaus and offices on organization, job classification, placement, and procedure; maintains records, renders reports, and makes all contacts with other Government agencies on matters relating to personnel; investigates cases of delinquency among employees and recommends appropriate disciplinary action; interprets the regulations applying to leave and efficiency ratings; reviews proposed changes affecting the status

of employees and recommends appropriate action to the Secretary; and sponsors and promotes educational courses for employees, welfare activities, and other measures which may contribute to improve the general morale of the Department.

3. Budget and Finance Administration and Service.--The Office of Budget and Finance has charge of the fiscal business of the Department. It prepares, in cooperation with the bureaus, the annual budget for the Department; prepares reports on appropriations and expenditures; advises with the bureaus on fiscal matters; maintains appropriation control accounts for the Department as a whole; maintains a Bureau Accounting Service for certain of the bureaus; and coordinates activities involving purchases, sales, and traffic within the Department. This office conducts the business of the Department with the Bureau of the Budget, the General Accounting Office, the Treasury Department, the Appropriations Committees, and other agencies of the Government concerned with fiscal and related matters.

4. General Operations.--The Division of Operation is responsible for the management of the buildings and other facilities occupied or used by the Department of Agriculture in the District of Columbia, the telephone and telegraph service, the mails and files, post office, emergency room, and the motor-truck and other service units. The chief of this division also acts as real-estate officer of the Department and as personnel and administrative officer for the internal operation of the Office of the Secretary, and supervises, in addition to the above-mentioned activities, the work of the immediate office comprising real estate and housing, personnel, engineering advice, preparation of budget estimates for the Office of the Secretary, the labor group, and the building directory and information service.

QUARTERS, HEAT, AND LIGHT ALLOWANCE AUTHORIZATIONS FOR 1938.

An increase from $33,400 to $40,000 is recommended in the amount of the proviso contained in the appropriation item for "Salaries, Office of the Secretary" which limits the total that may be paid from the several bureau appropriations applicable as allowances to officers and employees of the Department of Agriculture permanently statiened in foreign countries for living quarters, including heat, fuel, and light, under the provisions of the Act of June 26, 1930 (U.S.C., title 5, sec. 118a).

The allocations to the three bureaus involved, on a per annum basis, for the fiscal year 1937 and amounts estimated for 1938 are:

	F.Y. 1937	F.Y. 1938
Bureau of Agricultural Economics	$23,900	$23,900
Bureau of Animal Industry	1,400	1,400
Bureau of Entomology and Plant Quarantine	7,835	10,550
Departmental reserve authority for contingencies	265	4,150
Total	33,400	40,000

The authorization for the Bureau of Entomology and Plant Quarantine has been increased $2,715 (from $7,835 to $10,550). Of this amount, $255 will provide for increased allowances to three entomologists transferred from Hyeres, France, to Paris (with increase in allowance for one from $1,095 to $1,200 and for two each from $945 to $1,020), due to higher living costs in Paris; $1,020 will cover allowances for an additional entomologist to be assigned to Yokohama, Japan; and $720 each for two entomologists to be assigned to Mexico City, Mexico.

The amount for departmental reserve has been increased from $265 to $4,150, to provide for possible changes in assignment of foreign service employees, changes in the classification of posts, and for other unforeseen contingencies.

This proviso has been amended by the omission of the following language:

> [but the amount so used for any one person shall not exceed the amount permitted by law to be so used, during the same fiscal year, for any one person in the foreign service of the Department of Commerce]

This phraseology was first included in the 1935 Agricultural Appropriation Act incident to action by Congress liberalizing the reduced allowances then in effect under the Economy Act. At the time the Agriculture Bill was under consideration in the House (March, 1934) the amount of allowances for the foreign representatives of the Department of Commerce had not been determined, and the above provision was inserted in order that the allowances to employees of the Department of Agriculture might be equivalent to those to be allowed later, in the Commerce Bill, for representatives of the Department of Commerce. This provision is now unnecessary, since the laws applicable to both services establish a maximum allowance of $1,700. The Act of June 30, 1936, relating to all foreign services except that of the Department of Commerce, provides: "Under such regulations as the heads of the respective departments may prescribe and the President approve * * *". The "Standardized Regulations to Govern Allowances for Living Quarters, Heat, Fuel, and Light for Civilian Officers and Employees of the Government Stationed in Foreign Countries", submitted by the heads of Departments and approved by the President, authorizes allowances "not to exceed in any case the maxima under the classifications established pursuant to sections 5 and 6 of these regulations * * *". A maximum of $1,700 is set by the appropriation acts of the Departments of State and Commerce. Although the amounts allowed the foreign representatives of the Department of Commerce are not governed by these Standardized Regulations, inasmuch as the Department of Commerce is operating under a special statute applicable to that department only (U.S.C., title 15, sec. 197b (f), as a matter of fact the maximum allowance ($1,700) applicable to that Department is the same as that authorized by the Standardized Regulations.

A detailed schedule of the allowance amounts for 1936 and 1937 and the estimated amounts for 1938 follows.

Schedule of Allowances for
Quarters, Heat, and Light of Employees
Permanently Stationed Abroad Under Act of
June 26, 1930.

Appropriation and subappropriation	Title of position	Post of duty	Classification of post	Domestic status	Group	Salary	Allowances Estimated 1938	Allowances Estimated 1937	Allowances Actual, 1936
Bureau of Agricultural Economics:									
Salaries and expenses:									
Foreign Competition and Demand.....	Agri. Attache	Belgrade, Yugo.	IV	M	2	$6,000	$1,500	$1,500	$1,300
	Agri. Attache	Berlin, Germany	V	M	2	6,000	1,700	1,700	1,700
	Asst. Agri.Attache	" "	V	M	3	4,000	1,500	1,500	1,500
	Agri. Commissioner	" "	V	M	2	5,800	1,600	1,600	1,600
	Agri. Commissioner	Bombay, India	V	M	2	4,800	1,600	1,600	688
	Agri. Attache	Buenos Aires,Arg.	V	M	2	6,000	1,700	1,700	1,700
	Agri. Attache	London, England	V	M	2	6,000	1,700	1,700	1,487
	Asst. Agri.Attache	" "	V	M	3	4,600	1,500	1,500	62
	Agri. Commissioner	" "	V	M	2	5,800	1,600	1,600	1,600
	Agri. Commissioner	" "	V	M	2	6,000	1,600	1,600	-----
	Prin. Mktg. Spec.	Manchester, Eng.	IV	M	2	6,000	1,500	1,500	-----
	Agri. Attache	Paris, France	V	M	2	5,800	1,700	1,700	1,700
	Asst. Agri.Attache	" "	V	M	3	4,600	1,500	1,500	1,500
	Agri. Commissioner	Shanghai, China	V	M	2	6,000	1,700	1,700	1,700
	Asst. Agri. Comm.	" "	V	M	3	4,600	1,500	1,500	1,250
	Asst. Agri. Comm.	" "	V	M	3	3,800	-----	-----	1,438
Total, Bureau of Agricultural Economics.....						85,800	23,900	23,900	19,225
Bureau of Animal Industry:									
Salaries and expenses:									
Inspection and Quarantine.....	Sr. Veterinarian	London, England	V	M	2	4,600	1,400	1,400	1,400

Appropriation and subappropriation	Title of position	Post of duty	Classification of post	Domestic status	Group	Salary	Allowances Estimated 1938	Allowances Estimated 1937	Allowances Actual, 1936
Bureau of Entomology and Plant Quarantine:									
Salaries and expenses:									
Fruit Insects.....	Prin.Entomologist	Mexico City, Mex.	V	M	2	$5,800	$720	$720	$720
	Assoc. "	" " "	V	M	3	3,600	720	720	720
	Asst. "	" " "	V	S	3	2,900	500	500	500
	Asst. "	" " "	V	M	3	2,600	720	720	720
	Asst. "	" " "	V	M	3	2,600	720	-----	-----
	Asst. "	" " "	V	M	3	2,600	720	-----	-----
Foreign Parasite Introduction.....	Asst.Entomologist	Yokohama, Japan	IV	S	3	2,600	1,020	1,020	1,020
	Assoc. "	" "	IV	S	3	3,200	1,020	-----	-----
	Entomologist	Paris, France	V	M	2	4,200	1,200	-----	-----
	Entomologist	Hyeres, France	I	M	2	4,200	-----	1,095	780
	Asst.Entomologist	Paris, France	V	M	3	3,100	1,020	-----	-----
	Asst. "	Hyeres, France	I	M	3	3,100	-----	945	720
	Asst. "	Paris, France	V	M	3	3,100	1,020	-----	-----
	Asst. "	Hyeres, France	I	M	3	3,100	-----	945	390
Forest Insects.....	Assoc.Entomologist	Oxford, England	III	M	2	3,200	720	720	660
Cotton Insects.....	Asst.Entomologist	Tlahualilo, Mex.	I	M	3	2,800	450	450	450
Total, Bureau of Entomology and Plant Quarantine.....						42,300	10,550	7,835	6,680
Grand Total						132,700	35,850	33,135	27,305

(b) MISCELLANEOUS EXPENSES, DEPARTMENT OF AGRICULTURE

Appropriation Act, 1937.....	$120,748
Budget Estimate, 1938.....	105,750
Decrease.....	14,998

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)	Decrease
Miscellaneous Expenses, Department of Agriculture...	$92,996	$120,748(b)	$105,750(c)	-$14,998 (1)
Unobligated balance.....	28,307	- - -	- - -	- - -
Total appropriation.....	121,303(a)	120,748(b)	105,750(c)	- 14,998

(a) For 1936 includes $7,655 allotted from "Salaries, Office of the Secretary", and is exclusive of $2,800 allotted to "Salaries and Expenses", Office of the Solicitor.
(b) Exclusive of $25,000 transferred from "Salaries and Expenses, Agricultural Adjustment Administration" for increase in inventory of Central Supply Section, and includes $10,000 estimated unobligated balance, fiscal year 1937, continued available for expenditure in 1938 for moving expenses in connection with occupancy of final portions of new South Building.
(c) Exclusive of $10,000 estimated unobligated balance, fiscal year 1937, continued available for expenditure in 1938 for moving expenses in connection with occupancy of final portions of new South Building.

INCREASES AND DECREASES

(1) A net decrease of $14,998 is recommended in this item, as follows:

(a) Decrease of $6,000 due to the elimination in 1938 of a nonrecurring item included in the 1937 Act for equipping the final portions of the new South Building with window blinds. Construction work on the new portions of the building has progressed to such a degree that the installation of window blinds will be completed during the present fiscal year and the funds provided for this purpose may be omitted in 1938.

(b) Decrease of $10,000, due to the elimination in 1938 of the nonrecurring item of that amount included in the 1937 Act for moving expenses incident to the occupancy of the final portions of the new South Building. It has developed that, due to unforeseen delay in the work of installing requisite laboratory equipment and facilities in the new portions of the structure, the moving of certain units into space provided for them in the

new building must be postponed beyond the close of the fiscal year 1937 and a portion of the funds provided for moving expenses ($10,000) in the 1937 Act will necessarily be required for obligation in 1938. In order that the funds provided for this purpose in 1937 may be used in 1938, the inclusion of new language is requested continuing available in 1938 not to exceed $10,000 of the unexpended balance of the 1937 appropriation.

(c) Increase of $1,000 for travel expenses in connection with the accident prevention and public safety program. The work of the safety engineer requested under the appropriation "Salaries, Office of the Secretary" will require the inspection of stations and field operations of the Department with a view to determining the conditions under which employee accidents occur, devising means for eliminating hazards, directing the installation of safety appliances, and organizing and developing a program of safety education adapted to conditions in the various bureaus of the Department. The inspection of field stations and operations will require travel to various parts of the country, and $1,000 is requested for travel expenses for this purpose.

(d) An increase of $2 to round out, in even figures, the appropriation total under this appropriation item.

CHANGES IN LANGUAGE

The language of this paragraph has been amended by the insertion of the following:

> "together with not to exceed $10,000 of the unexpended balance of the appropriation for these purposes for the fiscal year 1937"

The Department estimates for 1938 provide for the dropping of a nonrecurring item of $10,000 contained in the 1937 Act for moving expenses in connection with the occupancy of the final portions of the new South Building. Due to unforeseen delay in the work of installing laboratory facilities and equipment, the moving of certain units into the new structure will be delayed beyond the close of the present fiscal year and a portion, or all, of the funds provided for this purpose in the 1937 Act will be needed, instead, in 1938 in order to complete the moving operations.

The statute citations under this paragraph have been amended to conform with the latest edition of the United States Code.

WORK UNDER THIS APPROPRIATION

This appropriation, as indicated by its terms, provides for a great variety of miscellaneous objects necessary in the conduct of the work of the Department, including stationery, furniture and office equipment and supplies, lumber, hardware, glass, paint, laundry, telegraphing and telephoning, ice, postage, travel expenses, maintenance and operation of motor vehicles, freight, express, and drayage charges,

and miscellaneous supplies and expenses not otherwise provided for and necessary for the practical and efficient work of the Department. It provides, also, for the compensation of the personnel of the Motor Transport Service and of such personnel of the Central Supply Section as may be engaged in the procurement, storage, issue, and shipment of supplies and materials for the several bureaus of the Department, reimbursement being made to this appropriation from the funds of the bureaus for which service is rendered.

EMERGENCY FUNDS

Direct Allotment

Projects	Estimated obligations, 1937
Agricultural Adjustment Administration (Salaries and Expenses), Office of the Secretary: Increase in inventory of Central Supply Section.....	$25,000

(c) RENT OF BUILDINGS IN THE DISTRICT OF COLUMBIA

Appropriation Act, 1937.....	$63,000
Budget Estimate, 1938.....	33,000
Decrease.....	30,000

PROJECT STATEMENT
(For detailed tabulation of buildings and rentals, see next page)

Projects	1936	1937 (Estimated)	1938 (Estimated)	Decrease
Rent of buildings in the District of Columbia.....	$60,947	$53,000	$33,000	-$20,000
Unobligated balance.....	2,053	10,000	- - -	- 10,000
Total appropriation.....	63,000	63,000	33,000	- 30,000(1)

(1) A decrease of $30,000 is recommended in this item for 1938 for the following reasons:

The anticipated completion during the present fiscal year of Wings 2 and 3 of the Department's new South Building will permit the removal from rented quarters of branches of the Forest Service now housed in the Atlantic Building (928-930 F Street, N.W.), at an annual rental of $30,000, and the

abandonment of space rented at $1,000 per annum at 1004 Eye Street, N.W., for film storage for the Forest Service, as well as basement space rented at $600 per annum at 920 F Street, N.W., for that bureau. Present plans also contemplate the removal of the Agriculture Group mechanical shops of the National Park Service from the old mechanical shops building located at 13th Street and Constitution Avenue, N.W., to space in the new portion of the South Building, and the assignment of space thus vacated on the first floor of the old shops building to the Motor Transport Service for the storage of motor vehicles, thus making possible the relinquishment of garage space for the Motor Transport Service now under rental at $900 per annum in Capital Court, S.W.

The rental for the Willard Building, 513-515 14th Street, N.W., occupied by the Bureau of Public Roads, and now paid from this appropriation, will be paid beginning with July 1, 1937 from funds available to that bureau, and a corresponding reduction is recommended in the "Rent of Buildings" appropriation for 1938. The existing lease covering this building expires June 30th, next, and is not renewable beyond that date. There are no other quarters available for the accommodation of the Bureau of Public Roads, and it will be necessary to negotiate a new lease for that bureau covering the occupancy of the structure beginning July 1, 1937.

It has been necessary during the current fiscal year to provide additional office quarters for the use of the Weather Bureau at a rental of $1,500 per annum, and $1,000 will be required to provide more satisfactory quarters for the Solar Radiation project of the Weather Bureau which is now housed in unsatisfactory quarters of a temporary character at the American University. During the coming fiscal year it will also be necessary to provide under this appropriation for the rental ($15,000) of space for the Eastern Region offices of the Forest Service now housed in the Victor Building, 724 9th Street, N.W., no space being available for this unit in the completed South Building.

The Department had confidently expected to effect the abandonment, during the current fiscal year, of rented space occupied at the American University by the Fixed Nitrogen Research Laboratory of the Bureau of Chemistry and Soils, but unanticipated delay in the work of installing requisite laboratory facilities and equipment in the space provided for this unit in the new sections of the South Building will necessitate the retention of these leased quarters for approximately one additional year.

In the following statement are shown the buildings and parts of buildings rented under this appropriation during the fiscal year 1936, and the estimated rentals for the fiscal years 1937 and 1938:

Building and Location	Bureau Occupying Space	F.Y.1936	F.Y.1937	F.Y.1938
Atlantic (928 F.St. N.W.)..	Forest Service.....	$30,000	$20,000(a)	------
Willard (513 14th St.N.W.).	Public Roads.....	15,000	15,000	(b)
Victor (724 9th St. N.W.)..	Forest Service.....	------	------	$15,000
McKinley (American Univ.)..	Chemistry & Soils.....	12,800	12,800	12,800
1214 24th Street, N.W.	Weather.....	------	1,250(c)	1,500
American University.....	Weather(Solar Radiation).....	------	------	1,000
2513 M Street, N.W.	Weather.....	1,000	1,000	1,000
1004 Eye Street, N.W.....	Forest Svc.(film storage).....	1,000	1,000	------
920 F Street, N.W.	Forest Service.....	600	400(d)	------
43 Capital Ct.S.W.(garage).	Motor Transport Service	489(e)	900	------
918 F Street, N.W.	Forest Service.....	58(f)	---	------
Reserve for emergency rentals and reconditioning of rented quarters upon relinquishment.....		2,053	650	1,700
Unapportioned reserve.....		-----	10,000	------
Total estimate or appropriation.....		63,000	63,000	33,000

(a) Rental July 1, 1936 to February 28, 1937, at $30,000 per annum.
(b) Rental to be assumed by Bureau of Public Roads in 1938.
(c) Rental September 1, 1936 to June 30, 1937, at $1,500 per annum.
(d) Rental July 1, 1936 to February 28, 1937, at $600 per annum.
(e) Rental December 16, 1935 to June 30, 1936, at $900 per annum.
(f) Rental July 1 to July 31, 1935, at $696 per annum.

WORK UNDER THIS APPROPRIATION

This appropriation provides funds for the rental of office, laboratory, and storage space for regular activities of the Department in the District of Columbia for which no quarters are available in Government-owned structures.

EMERGENCY FUNDS

(Complete bureau statement)

Direct Allotments

Projects	Obligated, 1936	Estimated obligations, 1937	Estimated obligations, 1938
Agricultural Adjustment Administration (transferred to Office of the Secretary):			
Salaries and Expenses:			
Administrative, accounting, auditing, personnel, investigative, and miscellaneous services and expenses in connection with the agricultural adjustment program	$353,026	- - -	- - -
Increase in inventory of Central Supply Section	- - -	$25,000	- - -
Payments for Agricultural Adjustment (Tobacco, Cotton, and Potato Acts):			
Inspection and investigational work	10,512	10,000	- - -
Total, A.A.A. Funds	363,538	35,000	- - -
Conservation and Use of Agricultural Land Resources, Department of Agriculture:			
Administrative, accounting, auditing, personnel, investigative, and miscellaneous services and expenses in connection with the conservation and use of agricultural land resources program	- - -	475,520	$475,520
Public Works Allotments (National Industrial Recovery Act):			
Installation of sewage treatment and disposal system at Beltsville (Md.) Research Center	6,346	- - -	- - -
Central feed mill and granary at Beltsville (Md.) Research Center	- - -	50,000	- - -
Total, Public Works Allotments	6,346	50,000	- - -
Total, Emergency Funds (Direct Allotments)	369,884	560,520	475,520

PASSENGER-CARRYING VEHICLES

The authorization under the appropriation for "Miscellaneous Expenses, Department of Agriculture" for the purchase and exchange of one passenger-carrying vehicle, at a net cost of not to exceed $1,500, contemplates the replacement during the fiscal year 1938 of the passenger automobile provided for the official use of the Secretary of Agriculture. At the time of its proposed replacement during the fiscal year 1938, the Secretary's automobile will have been in continuous operation for more than three years. No additional funds are involved in this item.

OFFICE OF THE SOLICITOR

(a) SALARIES AND EXPENSES

Appropriation Act, 1937	$188,801
Budget Estimate, 1938	194,160
Increase	+ 5,359

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)	Increase
Legal advice and assistance	$188,233	$188,801	$194,160	+$5,359 (1)
Unobligated balance	188	----	----	----
Total appropriation	188,421	188,801	194,160	+ 5,359 (1)

INCREASES

(1) The increase of $5,359 in this item for 1938 consists of:

(a) An increase of $4,860 for three additional stenographers at $1620 per annum each. The legal work of the Department has greatly increased during the past few years, requiring the employment of additional attorneys. In order to keep their work up to date, it has been necessary, as a temporary makeshift, to borrow stenographers from other Department agencies. The purpose of the increase is to partially alleviate this situation through the employment of three stenographers for direct assignment to the Office of the Solicitor.

(b) An increase of $499 for miscellaneous expenses. This small increase in the fund for miscellaneous expenses is needed for stationery and office supplies, telephone and telegraphic charges, and other like administrative costs incident to the greatly increased legal work.

WORK UNDER THIS APPROPRIATION

The Office of the Solicitor has charge of the legal work of the Department. This appropriation provides for salaries and expenses of the office, including (a) the division of national forests, grain futures, cotton futures, grain standards, cotton standards, Federal warehouse, excess wool profits, farm products inspection, produce agency, standard container, packers and stockyards, and perishable agricultural commodities; (b) the division of food and drugs, insecticides and fungicides, Federal seed, tea inspection, naval stores, virus-serum control, meat inspection, Federal import milk, Federal caustic poison, and compilation of laws; (c) the division of animal and plant quarantine, Federal-aid roads, 28-hour law, bee imports, and agricultural colleges and experiment stations; (d) the division of wildlife conservation, claims, fiscal, personnel, leases, contracts, and patents; (e) the division of business administration, in-

cluding the stenographic and the mail and files sections; and (f) the regional law officers in the field.

In addition, there are divisions handling the work under the Agricultural Adjustment Act, the Soil Conservation and Domestic Allotment Act, and the work of land acquisition, financed by allotments from the funds available for these purposes.

EMERGENCY FUNDS

Direct Allotments

Projects	Obligated, 1936	Estimated obligations, 1937	Estimated obligations, 1938
Agricultural Adjustment Administration (transferred to Office of the Solicitor):			
Salaries and Expenses: Legal work relating to Agricultural Adjustment Administration projects	$451,955	$327,980	$327,980
Payments for Agricultural Adjustment: Expenses in connection with liquidation of commodity program under Agricultural Adjustment Act	----	2,500	----
Total, A. A. A. Funds	451,955	330,480	327,980
Conservation and Use of Agricultural Land Resources, Department of Agriculture: Legal work in connection with conservation and use of agricultural land resources program	----	105,500	105,500
National Industrial Recovery, Agriculture, Wildlife Refuges: For legal services in connection with the acquisition of land for wildlife refuges	45,800	49,200	----
Emergency Relief Appropriation Act of 1935: For legal expenses in connection with title examination, etc., related to land acquisition projects, etc.	1,115,500	436,260	----
Total, Emergency Funds (Direct Allotments)	1,613,255	921,440	433,480

OFFICE OF INFORMATION

(a) SALARIES AND EXPENSES

Appropriation Act, 1937	$363,282
Budget Estimate, 1938	366,480
Increase	3,198

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)	Increase
1. General administration of Office of Information and of informational work of the Department.....	$18,397	$18,600	$18,600	- -
2. Business service, including mail and files	25,067	26,640	26,640	- -
3. Publications preparation and control:				
(a) Editorial control and final preparation of manuscripts	28,856	28,830	32,028	+$3,198(1)
(b) Preparation of Yearbook and special reports	9,978	11,930	11,930	- -
(c) Indexing Department publications.	9,107	9,000	9,000	- -
(d) Preparation of illustrations for publications	19,885	19,410	19,410	- -
(e) Photographic service for the Department.....	32,280	31,492	31,492	- -
(f) Printing procurement	14,652	14,640	14,640	- -
Total, Publications preparation and control	114,738	115,302	118,500	+ 3,198(1)
4. Distribution of agricultural information directly to the public:				
(a) Control of mailing lists for distribution work	9,674	9,650	9,650	- -
(b) Handling Congressional and general-public requests for agricultural information.....	53,181	50,870	50,870	- -
Total, Distribution of agricultural information directly to the public.	o2,855	60,520	60,520	- -

PROJECT STATEMENT-Continued.

Projects	1936	1937 (Estimated)	1938 (Estimated)	Increase
5. Preparation and distribution of agricultural information to the press	$30,892	$30,100	$30,100	- -
6. Preparation and distribution of agricultural information by radio	28,740	29,140	29,140	- -
7. Addressing, duplicating, and mailing service for the Department	81,915	82,980	82,980	- -
Unobligated balance	678	- -	- - -	- - -
Total appropriation	363,282	363,282	366,480	+ 3,198 (1)

INCREASE

(1) The increase of $3,198 for 1938 will provide for the services of an editor for Farmers' Bulletins, Leaflets, and other popular publications. The present editorial staff edits for accuracy in all classes of publications. It can not concentrate sufficiently on the writing, organization, and popularization of material intended for wide distribution. The Department issues each year from 8 to 10 million copies of popular publications. These are written by subject-matter specialists, most of whom are not skillful writers. They too often use technical phraseology, suitable for other scientists but not for lay readers. To reduce printing costs and to increase the usefulness of such publications, they must be edited, revised, or rewritten by a competent popular editor. It is a waste of Government funds not to have such an editor. The Division of Publications had an editor of popular publications until 1933. At that time, however, the staff was reduced and the editor of popular publications was transferred to another Federal agency. It is urgently necessary that the position be restored.

WORK UNDER THIS APPROPRIATION

General.--The work under this appropriation consists of bringing together, preparing, interpreting, and disseminating useful information developed by the economic, research, service, conservation, regulatory,

and many special programs of the Department. Essentially, problems are solved by specialists who are located in different bureaus; before information can be useful to the farmer, it must be brought together from different specialists and interpreted along commodity lines. This educational work is carried forward through numerous radio stations, in cooperation with the press, and by issuing technical and popular publications. The Office of Information handles all problems affecting the informational activities of the Department, including the editorial, illustrating, printing, and distribution phases, and supervises the informational activities of the 20 bureaus and offices of the Department; cooperates with more than 300 radio stations daily, which donate to the Department 35,000 hours of time annually; prepares annually 3,000 separate manuscript radio programs and approximately 1,700 press releases, and edits about 1,400 technical and popular manuscripts; cooperates with all agricultural colleges and experiment stations in maintaining an effective national policy for agricultural information; coordinates information of the Department with that of the Farm Credit Administration and other governmental agencies. At present greatest emphasis is placed on conservation and on important changes in practices which farmers themselves should make.

1. General Administration of Office of Information and of Informational Work of Department.--This office correlates the informational work of the bureaus of the Department with that of the Agricultural Adjustment Administration, other Federal agencies, and the land-grant colleges and extension services; establishes and controls information policies; determines what types of information are to be disseminated to be of greatest assistance to farmers and others, and supervises generally the bringing together of knowledge developed by specialists in the several bureaus.

2. Business Service, including Mails and Files.--The financial, business, purchasing, personnel, and legal affairs of the Office of Information are handled by this division. The central file section handles an average of 200,000 letters each month, vises all outgoing mail, and maintains subject-matter files and a library for the Office of Information.

3. Publications Preparation and Control.--If all significant material developed in the Department were published each year, there would be issued approximately 3,000 new circulars, technical bulletins, statistical bulletins, Farmers' Bulletins, and so on. This is not possible under available funds. The Office of Information must decide what material is to be published, in what form, and in what quantity. After selecting and arranging for the preparation of the most urgent material, the Office publishes an average of 1,400 manuscripts, including highly technical manuscripts covering basic economic and scientific research, and popular manuscripts carrying practical advice to farmers and others. It handles the editing, indexing, illustrating, and printing work involved. It prepares the Yearbook of Agriculture and the Secretary's annual report to the President and Congress.

4. Distribution of Agricultural Information Directly to the Public.--Publications comprise the most effective and cheapest means of getting agricultural science into practice and of placing economic information for emergency and long-time use into the hands of farmers and others.

The Office of Information distributes publications in two ways: (a) A very small group of cooperating scientists, libraries, and county agents receive selected bulletins direct through the use of highly classified mailing lists which are maintained and kept up to date in the Office; and (b) bulletins are mailed in response to specific requests, including requests cleared through Members of Congress. These requests seek information on every phase of agriculture, and the Office of Information selects those publications that will supply the required information. When incoming requests can be so handled, the total cost to the Government is about 1-1/2 cents each; but if bulletins are not available and a special letter must be prepared, the cost is about 30 cents each. The Department now has about 14,000 bulletins to select from in furnishing the information desired, but under the limitations of the printing fund only a small percentage of these are maintained on the free list.

5. Preparation and Distribution of Agricultural Information to the Press.--Practical information about the Department's regular and emergency activities is disseminated by issuing releases direct to the press, including farm papers, trade and technical journals, daily and weekly newspapers, press associations, special writers, and correspondents. Special articles on farming, gardening, household matters, and science are prepared for newspaper syndicates and for individual publications. Practically the entire press of the country receives material on the scientific, regulatory, and service work of the Department. Mailing lists are highly classified so that material is sent only to those publications likely to use it. The demands from the press for information have increased greatly because of the wide interest in the most fundamental type of information on such subjects as land planning, enlarged conservation programs, and scientific work in general.

6. Preparation and Distribution of Agricultural Information by Radio.--All of the radio programs of the Department are prepared by this office. The total amounts to more than 3,000 separate programs annually. At present the Department handles each day two network programs, originating in Washington, D. C., and San Francisco, California, and reaching most of the States through 60 stations associated with the National Broadcasting Company; and transmits syndicate programs to more than 370 individual stations. The Radio Service also supervises a weekly broadcast (Tuesday afternoons) over a network of 25 stations serving listeners in some 20 States with consumer information. The syndicate programs are now issued in cooperation with 35 of the State extension services, so as to localize the material. In some States the programs are being further localized and delivered by county agents. Thus localized, surveys show, these programs have become one of the most valuable sources of information for farmers. While radio is effective for disseminating all classes of agricultural information, it is indispensable for the rapid distribution of economic material. All radio time is donated by the stations.

7. Addressing, Duplicating, and Mailing Service for the Department.--For purposes of economy and efficiency, the Department maintains a centralized service unit for addressing, duplicating, and mailing work. Duplication by mimeograph and multigraph is essential for the rapid distribution of administrative orders, market reports, radio and press releases, progress reports, and other material too ephemeral in nature to justify printing. On the average, mimeographing costs about one-fifth

as much as printing; multigraphing costs about one-fourth and multilithing about one-third as much as printing. Duplicating is not a substitute for printing. The Department of Agriculture does not duplicate classes of material which ordinarily would be printed. Nevertheless, a recent decision of the Comptroller General compels the Depa tment to send to the Government Printing Office considerable material which would be satisfactory if reproduced by duplicating processes.

EMERGENCY FUNDS

Direct allotments

Projects	Obligated, 1936	Estimated obligations, 1937	Estimated obligations, 1938
Agricultural Adjustment Administration (Salaries and Expenses), Office of Information: For informal work in connection with agricultural adjustment programs	$14,490	- - -	- - -
Conservation and Use of Agricultural Land Resources, Department of Agriculture: For informational work in connection with agricultural land resources programs	- - -	$13,720	$13,720
Total, Emergency Funds (Direct Allotments)	14,490	13,720	13,720

(b) PRINTING AND BINDING

Appropriation Act, 1937	$854,250
Budget Estimate, 1938	887,650
Increase	33,400

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)	Increase or decrease
1. Job work and binding, expenditures for printing:				
(a) Binding	$28,608	$27,000	$30,000	+ $3,000
(b) Emergency field printing	1,273	6,000	7,500	+ 1,500
(c) Job work	223,939	242,000	250,900	+ 8,900
(d) Letterheads	11,446	11,600	11,600	- - -
Total	265,266	286,600	300,000	+ 13,400(1)

PROJECT STATEMENT - Continued

Projects	1936	1937 (Estimated)	1938 (Estimated)	Increase or decrease
2. Reports, periodicals, and other regulatory, service, and administrative publications, expenditures for printing:				
(a) Agricultural Situation...	$ 3,686	$ 5,000	$ 5,000	- - -
(b) Annual reports.....	12,362	11,500	11,500	- - -
(c) Climatological Data.....	13,932	18,300	18,300	- - -
(d) Congressional documents..	2,053	2,400	2,400	- - -
(e) Crops and Markets.....	30,318	31,000	31,000	- - -
(f) Experiment Station Record	17,731	17,500	17,500	- - -
(g) Extension Service Review	6,072	6,000	6,000	- - -
(h) Farmers' Bulletin lists..	6,218	3,050	3,050	- - -
(i) Forest folders.....	4,649	6,000	6,000	- - -
(j) Indexes.....	8,583	4,500	4,500	- - -
(k) Inventory of Seeds and Plants Imported.....	1,041	2,100	2,100	- - -
(l) Journal of Agricultural Research.....	5,541	5,850	5,850	- - -
(m) Monthly List of Publications.....	915	900	900	- - -
(n) Monthly Weather Review...	10,171	10,500	10,500	- - -
(o) Monthly Weather Review Separates.....	646	1,300	1,300	- - -
(p) Service and Regulatory Announcements.....	19,480	21,400	21,400	- - -
(q) Unnumbered publications..	21,156	17,300	17,300	- - -
(r) Yearbook of Agriculture..	17,000	17,000	15,000	-$ 2,000
(r-1)Agricultural Statistics	10,875	12,000	14,000	+ 2,000
Total.....	192,429	193,600	193,600	- - -
3. Research and technical bulletins, expenditures for printing:				
(a) Circulars.....	14,843	15,000	17,500	+ 2,500
(b) Experiment station bulletins and reports.....	971	1,300	2,300	+ 1,000
(c) Journal of Agricultural Research Separates.....	17,363	18,850	19,000	+ 150
(d) Reprints of former series and of outside articles.	1,232	1,200	1,800	+ 600
(e) Soil surveys.....	63,501	80,000	90,000	+ 10,000
(f) Statistical bulletins....	9,889	8,000	10,500	+ 2,500
(g) Technical bulletins.....	40,903	42,900	46,150	+ 3,250
Total.....	148,702	167,250	187,250	+ 20,000 (2)

PROJECT STATEMENT - Continued

Projects	1936	1937 (Estimated)	1938 (Estimated)	Increase or decrease
4. Farmers' Bulletins and other popular publications, expenditures for printing:				
(a) Clip Sheet	$ 2,456	$ 3,100	$ 3,100	- - -
(b) Farmers' Bulletins - new.	10,587	18,000	18,000	- - -
(c) Farmers' Bulletins - reprints and revisions..	130,970	142,000	142,000	- - -
(d) Leaflets - new	1,763	1,800	1,800	- - -
(e) Leaflets - reprints and revisions	6,049	7,400	7,400	- - -
(f) Miscellaneous publications	38,984	31,000	31,000	- - -
(g) Posters	1,792	2,500	2,500	- - -
(h) Yearbook separates	1,002	1,000	1,000	- - -
Total	193,603	206,800	206,800	- - -
Total appropriation	800,000	854,250	887,650	+ $33,400

General Statement

The total recommended under this item for 1938 is $887,650, compared with $854,250 for 1937, or an increase of $33,400. (This estimate does not include the printing requirements of the Soil Conservation Service or the Agricultural Adjustment Administration.)

Printing funds decreased from $1,000,000 in 1932 to $660,000 in 1933. Increases since then have been to offset the increased cost of printing, to provide additional funds for popular and technical bulletins, and, in general, to work toward the point at which the central fund will be adequate to meet the ordinary needs of the Department. So far as can now be determined, a fund of $1,000,000 would do this. The estimate of $887,650 is in line with the Department's consistent effort to proceed gradually toward a proper balance between research and other activities, on the one hand, and the printing requirement of those activities, on the other.

A detailed survey was recently made of the printing requirements of all bureaus and offices. It showed that every bureau in the Department has had to withhold important material in order to keep within the reduced printing fund; that 481 technical manuscripts and 276 popular manuscripts, which would have cost approximately $592,400 to print, were not submitted for printing during 1936 because of the inadequacy of funds; and that if the bureaus brought their publishing programs up-to-date, so that useful information now possessed by the Department would be currently available to those who need it, they would have to print 1,643 new publications. The Department will deal with this whole situation on a selective basis, in order to hold expenditures within the $887,650 estimated for 1938.

INCREASES

The increase of $33,400 in this appropriation for 1938 would be used for the following specific purposes:

(1) Job work and binding; increase, $13,400. -- Crop-reporting forms, schedules, standard forms, certificates, etc., are indispensable. They are merely tools to all fundamental Government procedure and routine. Increased regulatory activities have especially increased the need for forms. All bureaus are vitally concerned. The job-work requirements of the Bureau of Agricultural Economics, for example, have amounted to $80,000 annually, compared to $50,000 several years ago. The Department has an accumulation of more than 40,000 unbound reports, periodicals, and proceedings which must be bound for the Library.

A serious situation affecting this class of printing has developed as a result of the recent decision of the Comptroller General. Many job-forms, needed only in small volume, can be duplicated much more cheaply than they can be printed. Under the recent decision, all such work must be sent to the Government Printing Office, regardless of comparative costs.

(2) Research and technical bulletins; increase, $20,000, as follows:

(a) $10,000 for printing soil surveys. On July 1, 1936, a careful review of the soil-survey printing situation showed: (1) There was a lag of nearly five years between the completion of the field surveys and the publication of the maps and reports; (2) 32 reports were published during 1936, the field work on these having been completed in 1929, 1930, 1931, and 1932; (3) at that time, 35 reports were in press, field work on these having been completed in 1930, 1931, 1932, and 1935. On September 28, 1936 the situation was again reviewed. At that time field work had been completed on 138 areas but the results had not been printed. Maps had been constructed for 61 of these, and the reports were either in the printing office, editorial office, or in the field for review; maps were yet to be constructed for 77 of the areas. The survey also showed that the Bureau of Chemistry and Soils would submit to the Office of Information 55 of the surveys during the fiscal year 1937. The average cost of publishing each of these is between $2,000 and $2.200. This cost is increasing, partly because of higher lithographic and printing charges, and partly because the areas surveyed are larger than heretofore. Therefore, funds for 1937 are sufficient to print between 35 and 40 of the 55 surveys to be submitted. The amount estimated for 1938--$90,000--will be sufficient to print between 39 and 44 surveys.

(b) $10,000 for printing other technical data. -- This amount will enable the Department to print a few more of the essential circulars, statistical bulletins, technical bulletins, and related scientific material. As indicated in the general statement, the Department's research work is resulting in the preparation of more scientific manuscripts than can be printed under existing funds. The Department has always handled these manuscripts on a selective basis, printing those most essential. The increase provided will enable the Department to print more of the most urgently needed ones.

WORK UNDER THIS APPROPRIATION

The work under this appropriation consists of publishing the results of the scientific research, economic, service, regulatory, and conservation work of the Department. Necessary administrative forms, letterheads, certificates, etc., are printed. The various types of printed material may be grouped roughly into four classifications: (1) Administrative job work and binding; (2) administrative reports, periodicals, and publications; (3) research and technical publications; and (4) popular publications. The first two groups are used primarily to aid proper administration within the Department itself. Publications falling within the last two classifications are used to spread economic, scientific, and other practical knowledge to farmers, scientists, economists, processors, and the general public.

1. Job Work and Binding.

(a) Binding. -- Most of the binding work in the Department is done for the central Library, the Weather Bureau library, and the Office of Experiment Stations library. There is now an accumulation of more than 40,000 unbound periodicals, serials, reports, and proceedings. The average cost of binding was formerly about $1.50 to $1.90 a volume. It is now nearly $2.25 a volume. It is imperative to keep this material reasonably current if the Library is to give service because current material is in greatest demand.

(b) Emergency Field Printing.-- Inspection tags, certificates, forms for agricultural representatives abroad, fire-protection signs, etc., are often needed quickly and consequently can not be printed in Washington, D. C. This item covers these emergency needs.

(c and d) Job Work and Letterheads. -- Crop-reporting forms, schedules, administrative forms, certificates, etc., are indispensable simply to carry on the regular activities of the Department. Job printing needs are increasing.

2. Reports, Periodicals, and Other Regulatory, Service, and Administrative Publications.

(a) Agricultural Situation. -- This periodical, sent monthly to a small group of cooperating economists, technologists, officials of the Agricultural Adjustment Administration, and extension agents, is used to keep key groups in agriculture currently informed of the economic situation, including statistics relating to production, movement, consumption, prices, and purchasing power.

(b) Annual Reports. -- These reports briefly make a permanent record of the work performed during the preceding fiscal year. Most are required by law. In recent years they have been held to about 60 percent of their former size.

(c) Climatological Data. -- In addition to the regular issuance of Climatological data, Bulletin W (Summaries of Climatological Data) is being published. It comprises 106 separates covering the United States, Alaska, and Hawaii.

(d) Congressional Documents. -- The Department pays for bills, resolutions, reports, Congressional directories, the Congressional Record, etc., as Congressional documents.

(e) Crops and Markets. -- This periodical contains statistics and information on crops and livestock estimates (the printing of many of which is mandatory), market information, reports on supplies, stocks, commercial movements, etc. A separate from "Crops and Markets" is sent to 165,000 voluntary crop reporters, who receive no other payment for their services, and who use the periodical as a basis for future reports to the Department.

(f) Experiment Station Record. -- This journal abstracts the world's economic and scientific literature on agriculture, with particular reference to the research reports from the State experiment stations. This periodical is the cheapest and most effective means of keeping all research workers informed of current scientific developments, and it effectively promotes the coordination of research itself.

(g) Extension Service Review. -- This periodical, distributed monthly throughout the agricultural extension organization, contains current extension material regarding extension practices, accounts of decisions and actions of the Agricultural Adjustment Administration, and reviews of new extension developments in the various State institutions. It is especially important now because extension officials are field officers for the Agricultural Adjustment Administration.

(h) Farmers' Bulletin Lists. -- Farmers' Bulletins are mailed only upon request. Consequently, lists showing the available publications must be furnished to Congressmen, extension agents, and farmers.

(i) Forest Folders. -- More than 31 million persons visit the national forests each year. These folders are used to induce visitors to use the forests properly, thus reducing the fire hazard. They are now being used by members of the Civilian Conservation Corps to acquaint themselves with forestry purposes and practices.

(j) Indexes. -- As Department publications increase in number and scope, indexes become increasingly important.

(k) Inventory of Seeds and Plants Imported. -- These inventories contain a record of the new and little-known seeds and plants procured mostly from abroad for the use of the Department, State experiment stations, and experimenters in appropriate locations throughout the United States.

(l) Journal of Agricultural Research. -- This publication carries the most technical reports of pure research performed in the Department and the State experiment stations. Distribution is rigidly limited to selected libraries.

(m) Monthly List of Publications. -- For economy the Department does not list those who request to receive all printed publications. The list of new publications is mailed instead. Scientists, economists, foreign and domestic libraries, and teachers make up the bulk of the mailing list.

(n and o) Monthly Weather Review and Separates. -- This periodical contains reports of research by the staff of the Weather Bureau and records of weather observations in the United States, with climatological charts. It also deals with floods, storms, earthquakes, solar radiation, etc. It is distributed to Weather Bureau field stations, the Signal Corps, meteorological and naval air stations, and libraries. The separates, each covering a single subject or group of statistics, are distributed separately, for purposes of economy. This is the only meteorological publication of its kind in the United States. It is the textbook for weather officials. It is exchanged with foreign weather bureaus. The general public, of course, can obtain copies only by purchase.

(p) Service and Regulatory Announcements. -- Bureau of Animal Industry orders, notices of judgment, notices of quarantine, etc., are mandatory and are essential in carrying forward the regulatory programs.

(q) Unnumbered publications. -- This series is used for such bulletins as "Economic Trends Affecting Agriculture", "Forest Area Tables", "Daily River Stages", "Report on Highway Transportation", "The Taxation of Motor Vehicles", Bureau directories, instructions of airway meteorological service, weather forecasting, etc.

(r) Yearbook of Agriculture. -- This annual publication, required by law, is for all groups interested in the new developments of agriculture. The bulk of the Department's distribution is to its own collaborators, and most of the Congressional distribution (paid for from Congressional funds) is to farmers.

(r-1) Agricultural Statistics. -- Most of the statistics previously incorporated in the Yearbook of Agriculture are now published in a separate volume. This is for purposes of economy. Probably not more than ten percent of those who receive the Yearbook are interested in the detailed statistics. At the same time, many persons have real need for more statistics than have heretofore been published. By removing the statistics from the Yearbook, the total cost (departmental and Congressional) of publishing that book can be reduced by perhaps $25,000 to $40,000. A separate publication of statistics can be issued for $12,000 to $18,000. The volume of statistics is issued free mainly to official personnel and cooperators. Others can buy copies from the Superintendent of Documents.

3. Research and Technical Bulletins.

(a) Circulars. -- The circular reports in semitechnical form the results of the manifold research programs of the Department. The annual cost of circulars has in the past ranged from $20,000 to $30,000. The circulars are among a group of several classes of publications that can be postponed, if money is not available, but to do so would defeat the very purpose for which the Department exists.

(b) Experiment Station Bulletins and Reports. -- This series is used to report the results of research done at the insular experiment stations. It also includes the annual report of the insular stations.

(c) Journal of Agricultural Research Separates. -- The bound copies of the Journal itself are sent to a very restricted mailing list. Only libraries and foreign institutions on an exchange list receive it free of charge. Separates are sent to scientists who request technical information on the specific subject covered.

(d) Reprints of Former Series and of Outside Articles. -- A number of series such as Department Bulletins, Department Circulars, and Miscellaneous Circulars have been superseded by other series. However, much scientific information contained in the older publications is necessary in carrying on current work and can be reprinted for less than it would cost to print new manuscripts. Also, considerable current, technical material is printed in non-governmental publications; the Department often buys from 100 to 200 copies of these for official use.

(e) Soil Surveys. -- The soil-survey publications are mandatory by law. In 1930 the Department paid approximately $75,000 for printing soil surveys. In 1931 the expenditure was $97,000. In 1932 and 1933 the normal expenditures would have been approximately $100,000 each year, but to effect economies the Department spent only slightly more than $40,000 each year. Since then the printing program has fallen more and more behind. There are now 138 areas which have been surveyed and for which no reports have been published.

(f) Statistical Bulletins. -- Statistics of grain, statistics of future trading, and similar statistics -- the printing of many of which is mandatory -- are contained in this series.

(g) Technical Bulletins. -- This is one of the most important series of publications issued by the Department. They form a permanent record of research results for Department scientists, cooperating institutions, and scientists of the experiment stations. At present the Department faces the condition of achieving valuable research results without possessing the opportunity to give these results to the public in a usable form. Every effort has been made to reduce the length of each manuscript and the number of copies printed of each technical bulletin. But if a research report is to be valuable it must be complete. Consequently, the only alternative is to complete the preparation and editing of the technical manuscripts and then to hold them until funds for their printing are available. The cost of printing is such a small percentage of the total investment the Government has put into research itself that there is no economy in failing to give the taxpayers the results for which they have paid.

4. Farmers' Bulletins and Other Popular Publications

(a) Clip Sheet. -- The Clip Sheet, sent weekly to 4,000 newspapers, contains brief suggestions on improved farm practices, economic adjustments, and accounts of Department activities.

(b,c,d, and e) Farmers' Bulletins and Leaflets -- New and Reprints. -- Farmers' Bulletins contain practical information for farmers. They constitute one of the most effective means of putting science into practice. Four-fifths of all Farmers' Bulletins are distributed by Members of Congress. The Department and most Members of Congress mail publications only upon specific request. The leaflets are merely 4-and 8-page Farmers' Bulletins. These bulletins cost, including printing and mailing charges combined, only about 1-1/2 cents a copy. If they did no more than enable the Department expeditiously and efficiently to answer correspondence, they would be worth far more than they cost.

(f) Miscellaneous Publications. -- Such publications as "Meat Dishes at Low Cost", "The Pasture Handbook", "Soil Blowing and Dust Storms", "List of Technical Workers", "List of Available Publications", "Agricultural Outlook" (annual), etc., are included in this series. The material is largely non-technical and the distribution in all cases is specialized.

(g) Posters. -- Special campaigns such as bovine tuberculosis eradication, Bang's disease control, avian tuberculosis eradication, and fire protection require posters to induce large numbers of people to better inform themselves of their problems and to cooperate in their solution.

(h) Yearbook Separates. -- The Yearbook is usually made up of a number of separate, specialized articles, even though they bear on a common theme, such as in the "Genetics Yearbook". Some of these are printed in very small volume as separates to use in answering correspondence.

EMERGENCY FUNDS

Direct Allotment

Projects	Obligated 1936	Estimated obligations, 1937
Emergency Relief Appropriation Act of 1935: For standard and departmental forms for use in connection with Emergency relief programs of the Department	$5,000	$15,000

EMERGENCY FUNDS
(Complete bureau statement)

Direct Allotments

Projects	Obligated 1936	Estimated obligations, 1937	Estimated obligations, 1938
Agricultural Adjustment Administration (Salaries and Expenses), Office of Information: Informational work in connection with agricultural adjustment programs.....	$14,490	- - -	- - -
Conservation and Use of Agricultural Land Resources, Department of Agriculture: For informational work in connection with agricultural land resources programs.....	- - -	13,720	13,720
Emergency Relief Appropriation Act of 1935: For standard and departmental forms, emergency relief programs.....	5,000	15,000	15,000
Total, Emergency Funds(Direct Allotments).....	19,490	28,720	28,720

LIBRARY

SALARIES AND EXPENSES

Appropriation Act, 1937	$103,800
Budget Estimate, 1938	105,420
Increase	1,620

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)	Increase
1. General administration and business service	$16,294	$17,430	$18,510	+ $1,080(1)
2. Acquisition of publications by purchase, gift, and exchange, and preparation of material for binding	45,934	48,260	48,800	+ 540(2)
3. Classifying, cataloguing, and indexing of publications	21,323	20,495	20,495	------
4. Circulation, reference, and bibliographical service	16,261	17,615	17,615	------
Total appropriation	99,812	103,800	105,420	+ 1,620

(1) An increase of $1,080 in Project 1, "General administration and business service" is requested to provide for the employment of an additional messenger whose services are urgently needed because of the increase in the messenger work of all divisions of the Library.

(2) An increase of $540 in Project 2, "Acquisition of books by purchase, gift, and exchange, and preparation of material for binding" is requested for the purchase of urgently needed current scientific books and for important general reference books. The funds now available are insufficient to meet the demands of the bureaus.

WORK UNDER THIS APPROPRIATION

The Department Library is one of the basic units in the research, extension, and regulatory work of the Department and the State agricultural agencies. It performs a most important and essential service which is in constant use in all branches of the Department's work. With its specialized branch libraries in the various bureaus it contains in all approximately 267,000 volumes on agriculture and the related sciences, technology, and economics, including the official agricultural publications from foreign countries as well as the United States. It is the largest special collection of this kind in the country. Its catalogues and special indexes on subjects connected with the Department's work number more than a million cards. They constitute an invaluable record of the findings of scientific investigations in the field of agriculture all over the world and enable the Library to act as a clearing house of bibliographical information relating to the literature of agriculture in all its phases.

The appropriation of the Library is used for four main purposes, as follows: (1) for the acquisition of books, periodicals, newspapers, and other publications needed in the work of the Department; (2) for the work of entering these publications in the permanent catalogues and other records of the Library; (3) for the reference and bibliographical service necessary to make these publications readily available to users of the Library and to answer the various bibliographical inquiries addressed to the Department; and (4) for the circulation of the Library's books and periodicals to Department workers and to other research institutions, particularly to the State agricultural colleges and experiment stations.

EMERGENCY FUNDS

Direct Allotments

Projects	Obligated, 1936	Estimated obligations, 1937	Estimated obligations, 1938
Agricultural Adjustment Administration (Salaries and Expenses):			
Transferred to Library for reference work and circulation of books and periodicals.....	$4,128	$3,240	$3,240

OFFICE OF EXPERIMENT STATIONS

(a) PAYMENTS TO STATES, HAWAII, ALASKA, AND PUERTO RICO FOR AGRICULTURAL EXPERIMENT STATIONS

Appropriation Act, 1937.....$5,620,000
Budget Estimate, 1938..... 6,242,500
Increase..... 622,500

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)	Increase
1. Hatch Act (Act March 2, 1887)....	$720,000	$720,000	$720,000	- - -
2. Adams Act (Act March 16, 1906)...	720,000	720,000	720,000	- - -
3. Purnell Act (Act February 24, 1925).....	2,880,000	2,880,000	2,880,000	- - -
4. Hawaii Station Act (Act May 16, 1928).....	30,000	50,000	60,000	+$10,000(1)
5. Alaska Station Acts (Act February 23, 1929; Act June 20, 1936).....	15,000	15,000	22,500	+ 7,500(2)
6. Puerto Rico Station Act (Act March 4, 1931).....	30,000	35,000	40,000	+ 5,000(3)
7. Bankhead-Jones Act, Title I (Act June 29, 1935).....	(a)600,000	1,200,000	1,800,000	+600,000(4)
Total appropriation.....	4,995,000	5,620,000	6,242,500	+622,500

(a) Appropriated in Second Deficiency Act approved August 12, 1935 (49 Stat. 582)

INCREASES

The increase of $622,500 in this item for 1938 consists of:

(1) An increase of $10,000 in Project 4, "Hawaii Station Act (Act May 16, 1928)". This increase is for the purpose of carrying out the provisions of the Hawaii Station Act, which authorizes $60,000 for the fiscal year 1938.

(2) An increase of $7,500 in Project 5, "Alaska Station Acts (Act February 23, 1929; Act June 20, 1936)". This increase is for the purpose of carrying out the provisions of the Act of June 20, 1936, which authorizes $7,500 for the fiscal year 1938, in addition to the $15,000 authorized by the Act of Feb. 23, 1929.

(3) An increase of $5,000 in Project 6, "Puerto Rico Station Act (Act March 4, 1931)". This increase is for the purpose of carrying out the provisions of the Puerto Rico Station Act, which authorizes $40,000 for the fiscal year 1938.

(4) An increase of $600,000 in Project 7, "Bankhead-Jones Act, Title I (Act June 29, 1935)". This increase is for the purpose of carrying out the provisions of title I of the Bankhead-Jones Act, which authorizes $1,800,000 for payments to States for the fiscal year 1938.

CHANGES IN LANGUAGE

Side (or paragraph) titles "Hatch Act:", "Adams Act:", and "Purnell Act:", have been inserted in the paragraphs covering, respectively, the Acts of March 2, 1887, March 16, 1906, and February 24, 1925, for convenience in referring to these sections.

To carry into effect the provisions of the Alaska Station Act of June 20, 1936, new language has been added to the paragraph headed "Alaska" as follows:

> "And the provisions of Sec. 2 of the Act entitled 'An Act to extend the benefits of the Adams Act, the Purnell Act, and the Capper-Ketcham Act to the Territory of Alaska, and for other purposes', approved June 20, 1936 (49 Stat., p. 1553), $7,500; in all, for Alaska, $22,500."

A side (or paragraph title "Title I, Bankhead-Jones Act:" has been inserted in the paragraph pertaining to the Act of June 29, 1935, for convenience in referring to this section. The reference in this paragraph to "(49 Stat., pp. 436-439)" is replaced by the citation "(U.S.C., Supp. I, title 7, secs. 427-427g)" to conform with the latest edition of the United States Code.

WORK UNDER THIS APPROPRIATION

General.--The several appropriations under "Payments to States," etc., are made to aid and encourage research at the State, Territorial, and Puerto Rican agricultural experiment stations bearing on the agricultural industry. The funds are warranted direct by the Treasury Department, upon certification by the Secretary of Agriculture, to the institutions designated by the several States, Hawaii, Alaska, and Puerto Rico under the following Acts:

1. The Hatch Act (March 2, 1887) authorizes $15,000 per annum to each State for agricultural experiment stations to "aid in acquiring and diffusing among the people of the United States useful and practical information on subjects connected with agriculture, and to promote scientific investigation and experiment respecting the principles and applications of agricultural science."

2. The Adams Act (March 16, 1906) authorizes $15,000 per annum to each State for the more complete endowment and maintenance of the State agricultural experiment stations to be"applied only to paying the necessary expenses of conducting original researches or experiments bearing directly on the agricultural industry of the United States."

3. The Purnell Act (February 24, 1925) authorizes $60,000 per annum to each State for the more complete endowment of agricultural experiment stations to be "applied only to paying the necessary expenses of conducting investigations or making experiments bearing directly on the production, manufacture, preparation, use, distribution, and marketing of agricultural products and including such scientific researches as have for their purpose the establishment and maintenance of a permanent and efficient agricultural industry and such economic and sociological

investigations as have for their purpose the development and improvement of the rural home and rural life and for printing and disseminating the results of said researches."

4. The Hawaii Station Act (May 16, 1928) extends the benefits of the Hatch, Adams, and Purnell Acts to the Territory of Hawaii and authorizes appropriations for this purpose as follows: 1930, $15,000; 1931, $20,000; 1932 to 1936, inclusive, $2,000 increase each year over the preceding year; 1937, $50,000; 1938 to 1941, inclusive, $10,000 increase each year over the preceding year; and thereafter $90,000 per year.

5. The Alaska Station Acts.--The Act of February 23, 1929 extends the benefits of the Hatch Act to the Territory of Alaska. The Act of June 20, 1936 extends the benefits of the Adams and Purnell Acts to the Territory of Alaska and authorizes appropriations as follows: Fiscal year 1937, $5,000; 1938, $7,500; 1939 to 1944, inclusive, $2,500 increase each year over the preceding year; 1945 to 1947, inclusive, $5,000 increase each year over the preceding year; and thereafter a sum equal to one-half that provided for each State and Territory under the Adams Act and the Purnell Act.

6. The Puerto Rico Station Act (March 4, 1931) extends the benefits of the Hatch, Adams, and Purnell Acts to Puerto Rico and authorizes appropriations as follows: 1933, $15,000; 1934 to 1940, inclusive, $5,000 increase each year over the preceding year; 1941 to 1944, inclusive, $10,000 increase each year over the preceding year; and thereafter $90,000 per year.

7. The Bankhead-Jones Act (June 29, 1935).--Title I of this Act provides as follows:

"Section 1. The Secretary of Agriculture is authorized and directed to conduct research into laws and principles underlying basic problems of agriculture in its broadest aspects; research relating to the improvement of the quality of, and the development of new and improved methods of production of, distribution of, and new and extended uses and markets for, agricultural commodities and byproducts and manufactures thereof; and research relating to the conservation, development, and use of land and water resources for agricultural purposes. Research authorized under this section shall be in addition to research provided for under existing law (but both activities shall be coordinated so far as practicable) and shall be conducted by such agencies of the Department of Agriculture as the Secretary may designate or establish.

"Sec. 2. The Secretary is also authorized and directed to encourage research similar to that authorized under section 1 to be conducted by agricultural experiment stations established or which may hereafter be established in pursuance of the Act of March 2, 1887, providing for experiment stations, as amended and supplemented, by the allotment and payment as provided in section 5 to Puerto Rico and the States and Territories for the use of such experiment stations of sums appropriated therefor pursuant to this title.

"Sec. 3. For the purposes of this title there is authorized to be appropriated, out of any money in the Treasury not otherwise appropriated, the sum of $1,000,000 for the fiscal year beginning after the date of the enactment of this title, and for each of the four fiscal years thereafter $1,000,000 more than the amount authorized for the preceding fiscal year, and $5,000,000 for each fiscal year thereafter. Moneys appropriated in pursuance of this title shall also be

available for the purchase and rental of land and the construction of buildings necessary for conducting research provided for in this title, for the equipment and maintenance of such buildings, and for printing and disseminating the results of research. Sums appropriated in pursuance of this title shall be in addition to, and not in substitution for, appropriations for research or other activities of the Department of Agriculture and sums appropriated or otherwise made available for agricultural experiment stations.

"Sec. 4. Forty per centum of the sums appropriated for any fiscal year under section 3 shall be available for the purposes of section 1: Provided, That not to exceed 2 per centum of the sums appropriated may be used for the administration of section 5 of this title. The sums available for the purposes of section 1 shall be designated as the 'Special research fund, Department of Agriculture', and no part of such special fund shall be used for the prosecution of research heretofore instituted or for the prosecution of any new research project except upon approval in writing by the Secretary. One-half of such special research fund shall be used by the Secretary for the establishment and maintenance of research laboratories and facilities in the major agricultural regions at places selected by him and for the prosecution, in accordance with section 1, of research at such laboratories.

"Sec. 5. (a) Sixty per centum of the sums appropriated for any fiscal year under section 3 shall be available for the purposes of section 2. The Secretary shall allot, for each fiscal year for which an appropriation is made, to Puerto Rico and each State and Territory an amount which bears the same ratio to the total amount to be allotted as the rural population of Puerto Rico or the State or Territory bears to the rural population of Puerto Rico and all the States and Territories as determined by the last preceding decennial census. No allotment and no payment under any allotment shall be made for any fiscal year in excess of the amount which Puerto Rico or the State or Territory makes available for such fiscal year out of its own funds for research and for the establishment and maintenance of necessary facilities for the prosecution of such research. If Puerto Rico or any State or Territory fails to make available for such purposes for any fiscal year a sum equal to the total amount to which it may be entitled for such year, the remainder of such amount shall be withheld by the Secretary. The total amount so withheld may be allotted by the Secretary of Agriculture to Puerto Rico and the States and Territories which make available for such year an amount equal to that part of the total amount withheld which may be allotted to them by the Secretary of Agriculture, but no such additional allotment to Puerto Rico or any State or Territory shall exceed the original allotment to Puerto Rico or such State or Territory for that year by more than 20 per centum thereof.

"(b) The sums authorized to be allotted to Puerto Rico and the States and Territories shall be paid annually in quarterly payments on July 1, October 1, January 1, and April 1. Such sums shall be paid by the Secretary of the Treasury upon warrant of the Secretary of Agriculture in the same manner and subject to the same administrative procedure set forth in the Act of March 2, 1887, as amended June 7, 1888.

"Sec. 6. As used in this title the term 'Territory' means Alaska and Hawaii.

"Sec. 7. The Secretary of Agriculture is authorized and directed to prescribe such rules and regulations as may be necessary to carry out this Act.

"Sec. 8. The right to alter, amend, or repeal this Act is hereby expressly reserved."

The allotments to the several States, Alaska, Hawaii, and Puerto Rico for the fiscal years 1936, 1937, and 1938 are shown in the following table:

Payments to States, Hawaii, Alaska, and Puerto Rico under Bankhead-Jones Act, Title I.

State	1936	1937	1938
Alabama	$20,673.78	$41,347.56	$62,021.34
Alaska	559.12	1,118.24	1,677.36
Arizona	3,105.64	6,211.28	9,316.92
Arkansas	15,995.80	31,991.60	47,987.40
California	16,485.49	32,970.98	49,456.47
Colorado	5,607.74	11,215.48	16,823.22
Conn. (New Haven)	2,582.26	5,164.52	7,746.78
Conn. (Storrs)	2,582.26	5,164.52	7,746.78
Delaware	1,252.55	2,505.10	3,757.65
Florida	7,700.41	15,400.82	23,101.23
Georgia	21,880.73	43,761.46	65,642.19
Hawaii	2,296.60	4,593.20	6,889.80
Idaho	3,429.64	6,859.28	10,288.92
Illinois	21,684.13	43,368.26	65,052.39
Indiana	15,680.65	31,361.30	47,041.95
Iowa	16,213.66	32,427.32	48,640.98
Kansas	12,512.74	25,025.48	37,538.22
Kentucky	19,734.51	39,469.02	59,203.53
Louisiana	13,783.36	27,566.72	41,350.08
Maine	5,173.04	10,346.08	15,519.12
Maryland	7,137.62	14,275.24	21,412.86
Massachusetts	4,545.55	9,091.10	13,636.65
Michigan	16,741.96	33,483.92	50,225.88
Minnesota	14,199.41	28,398.82	42,598.23
Mississippi	18,162.85	36,325.70	54,488.55
Missouri	19,241.95	38,483.90	57,725.85
Montana	3,875.79	7,751.58	11,627.37
Nebraska	9,694.15	19,388.30	29,082.45
Nevada	615.16	1,230.32	1,845.48
New Hampshire	2,089.30	4,178.60	6,267.90
New Jersey	7,631.46	15,262.92	22,894.38
New Mexico	3,440.25	6,880.50	10,320.75
New York (Geneva)	2,245.79	4,491.58	6,737.37
New York (Ithaca)	20,212.12	40,424.24	60,636.36
North Carolina	25,657.00	51,314.00	76,971.00
North Dakota	6,168.94	12,337.88	18,506.82
Ohio	23,253.69	46,507.38	69,761.07
Oklahoma	17,112.71	34,225.42	51,338.13
Oregon	5,043.95	10,087.90	15,131.85
Pennsylvania	33,672.38	67,344.76	101,017.14
Puerto Rico	12,138.04	24,276.08	36,414.12
Rhode Island	565.96	1,131.92	1,697.88
South Carolina	14,866.24	29,732.48	44,598.72
South Dakota	6,108.11	12,216.22	18,324.33
Tennessee	18,695.97	37,391.94	56,087.91
Texas	37,341.19	74,682.38	112,023.57
Utah	2,625.92	5,251.84	7,877.76
Vermont	2,617.90	5,235.80	7,853.70
Virginia	17,786.14	35,572.28	53,358.42
Washington	7,378.93	14,757.86	22,136.79
West Virginia	13,453.36	26,906.72	40,360.08
Wisconsin	15,056.22	30,112.44	45,168.66
Wyoming	1,689.88	3,379.76	5,069.64
Total	600,000.00	1,200,000.00	1,800,000.00

(b) ADMINISTRATION OF GRANTS TO STATES AND COORDINATION OF RESEARCH

Appropriation Act, 1937	$161,735
Budget Estimate, 1938	161,735

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)
Administration and coordination of Federal aid to agricultural experiment stations; assistance in coordination of research work of the Department; assistance in coordination of research work of the Department with that of the State stations; administration of Department insular stations; and preparation of "Experiment Station Record" and other publications	$155,558	$161,735	$161,735
Unobligated balance	2,677	- - -	- - -
Total appropriation	156,235	161,735	161,735

CHANGE IN LANGUAGE

The word "and" has been deleted after the citation applying to the Act of February 23, 1929, and the words "and June 20, 1936 (49 Stat., pp. 1553-1554)" have been inserted following the citation applying to the Act of March 4, 1931, to include reference to the Act of June 20, 1936, extending the benefits of the Adams Act and the Purnell Act to the Territory of Alaska.

WORK UNDER THIS APPROPRIATION

The Office of Experiment Stations (a) represents the Department in the administration of the Acts of Congress making appropriations for the support of State and Territorial agricultural experiment stations in the several States, Hawaii, Alaska, and Puerto Rico (Hatch Act, Adams Act, Purnell Act, Title I of the Bankhead-Jones Act, and the Hawaii, Alaska, and Puerto Rico Stations Acts); (b) assists in the coordination of the research work of the Department and the coordination of the research of the State agricultural experiment stations under Federal grants, together with the

coordination of such research with that of the Department; and (c) administers the Federal agricultural experiment stations in Hawaii and Puerto Rico.

Administration of the Acts granting funds to States and Territories involves supervision of the funds, close advisory relations with the stations as to research for which the funds are expended, annual examination of the work and expenditures of each station, coordination of the research activities of the Department with those of State stations, preparation and issuance of the "Experiment Station Record" and other reports, and preparation of the annual report to Congress on the work and expenditures of the stations as called for in the Acts.

The Federal funds paid to the States and Territories are largely expended on research projects submitted to the Office of Experiment Stations for advisory suggestions and approval in advance of expenditures. Programs of projects with proposed expenditures under the Federal funds are submitted by each station for review and approval at the beginning of each fiscal year. Changes and adjustments in work to best meet State needs are submitted throughout the year. There were 2,192 active Adams and Purnell projects in 1936, of which 314 were new or revised during the year. An additional 360 projects under the new Bankhead-Jones funds were examined and approved.

To carry out the provisions of the Federal Acts a representative, or representatives, of the Office visits each of the 50 State stations at least once annually and spends three to fifteen days reviewing the expenditures and the research under way. In addition, staff members cooperate as specialists with individual stations and regional groups in the consideration of research programs for special fields.

Assistance in coordinating the research of the Department of Agriculture with that of the State and Territorial stations and in coordinating the research work among State stations is constantly in mind when the proposed research projects under Federal funds are reviewed for approval and when the work and expenditures of each station are reviewed and discussed with the State station directors and research staffs. Through personal conferences and committees having to do with research, close advisory relations are maintained with bureaus of the Department. Every opportunity is taken to promote effective cooperation between and among the State stations and between the State stations and the Department. During the fiscal year 1936 there were 818 cooperative agreements between State stations and the bureaus of the Department. These had been carefully planned by the cooperating agencies and written agreements signed. These agreements were reviewed and filed by the Office of Experiment Stations. Every State station entered into at least two such agreements. Fourteen entered into 20 or more.

The "Experiment Station Record" was established in 1889 as a part of the Federal-State joint participation in establishing and maintaining agricultural experiment stations. Its purpose is to make available promptly to staff members of all stations and the Department abstracts of current published results of research in this and other countries as an aid in planning research, avoiding duplication, and coordinating research effort. A total of about 7,000 such abstracts are prepared, edited, and published annually, involving translations from twelve or more languages. The abstract volumes

are supplemented by indexes and a combined index is published for each ten volumes. Few, if any, of the stations have all the publications available, and the abstracting done by the Office of Experiment Stations avoids the necessity of duplicate abstracting by the several thousand research workers. As a part of this function the Office represents the Department's cooperation with "Biological Abstracts" to the extent of furnishing copies of abstracts of publications by the State stations and the Department.

As a central agency for the State stations the Office of Experiment Stations compiles lists of research projects in special fields, maintains an up-to-date list of the organization and personnel of the several stations and publishes a revised list annually, issues a monthly mimeographed list of new station publications, and prepares other lists and compilations of information.

The Office also answers a very large volume of inquiries from all parts of the world regarding the organization, personnel, relationships, and work of the State stations and agricultural conditions and possibilities in Alaska, Guam, the Virgin Islands, and Puerto Rico.

Assistance in coordinating the research work of the Department of Agriculture is accomplished through advising with the bureau chiefs and the Secretary of Agriculture with regard to the coordination and correlation of proposed research. Special attention is given to adjustments of closely related research in different bureaus and to the coordination and integration of any new research with existing activities of the Department. The Office of Experiment Stations is responsible for the development of the programs, for presentation to the Secretary, for work to be undertaken by the bureaus of the Department under special research projects and at the special research laboratories in the major agricultural regions provided for by Title I of the Bankhead-Jones Act, for general assistance in planning, directing, and supervising the work, and for the administration of the funds. In connection with other funds, the Chief of Office participates in the preparation of research programs and budget estimates, especially in regard to coordination and cooperation, and serves on some 12 committees having to do primarily with policy, coordination, and cooperation in research.

Administration of the Federal stations in Puerto Rico and Hawaii involves approval of budgets, expenditures, and research projects; the review, editing, and approval of publications; and general administrative direction. During the past few years there has developed, in addition, a responsibility for coordination of these Federal stations and their work with the Territorial experiment stations and their research. Hawaii, under the Hawaii Station Act of May 16, 1928, and Puerto Rico, under the Puerto Rico Station Act of March 4, 1931, now receive the benefit of the funds under the Hatch and supplemental Acts. The Acts granting these funds to the Territories, however, provide that the Secretary of Agriculture shall coordinate the work of the Territorial stations and the work of the Federal stations.

In addition to the regular appropriations for the Federal Hawaii and Puerto Rico stations, the President approved on April 24, 1935, one Sugar Processing Tax Order allotting $113,000 to the Puerto Rico station and between August 21 and October 24, 1935, seven such orders allotting a total of $410,000 to the Hawaii Station. These allotments were continued by the Supplemental Appropriation Act, fiscal year 1936 (49 Stat., 1116). The funds

are available until expended. At the end of the fiscal year 1936 approximately $72,500 of the allotment to the Puerto Rico station and $124,200 of the allotments to the Hawaii station had been expended. The major parts of the balances will be expended during the fiscal year 1937, but there will probably be some carry-overs in 1938. These allotments have presented to the Washington office many unusual problems in connection with the authorization of expenditures, the obtaining of personnel and equipment, and the organization and carrying out of the separate lines of work authorized.

(c) INSULAR EXPERIMENT STATIONS

Appropriation Act, 1937..... $69,311
Budget Estimate, 1938 69,311

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)	Increase or decrease
1. Federal Experiment Station in Hawaii.....	$32,066	$12,066	$ 2,066	-$10,000(1)
2. Federal Experiment Station in Puerto Rico.....	37,245	57,245	67,245	+10,000(2)
Total appropriation.....	69,311	69,311	69,311	- - -

INCREASE OR DECREASE

(1) A decrease of $10,000 in Project 1, "Federal Experiment Station in Hawaii". This decrease is made to offset the increase of $10,000 for 1938 under the Hawaii Station Act (Act May 16, 1928), under "Payments to States, Hawaii, Alaska, and Puerto Rico for Agricultural Experiment Stations."

(2) An increase of $10,000 in Project 2, "Federal Experiment Station in Puerto Rico". This increase is recommended to continue those investigations holding promise for the agriculture of the continental United States which were initiated under Funds originally made available from Sugar Processing Tax funds and later continued by the Supplemental Appropriation Act, fiscal year 1936 (49 Stat., 1116). These investigations, which were initiated in cooperation with the bureaus of the Department, are also of importance in the agricultural rehabilitation of Puerto Rico and include: (1) Introduction and investigation of important drug plants, including plants for the production of quinine and for possible new agricultural enterprises in the United States; (2) introduction and investigation of insecticidal plants, especially those for the production of rotenone; (3) introduction and investigation of plants having promise through selection and improvement for agriculture in subtropical parts of the United States; (4) cooperation with Department bureaus in the propagation of sweetpotato breeding stocks from seed; and (5) other phases of Departmental research which profit by tropical facilities, including control of animal parasites, insects, and plant diseases. These lines of work can be most economically and effectively conducted at such

a tropical outpost station of the Department as it is desired to develop in Puerto Rico, where a twelve months' growing season is particularly favorable to such investigations.

Total expenditures at the station, including those from Sugar Processing Tax funds, are estimated at $108,177 in 1936 and $95,245 in 1937. As the Processing Tax funds will be exhausted for all practical purposes in 1938, the expenditures for that fiscal year, including the recommended increase, are estimated at $67,245, a decrease of $28,000, compared with 1937, and $40,932 compared with 1936.

WORK UNDER THIS APPROPRIATION

General.--The agricultural experiment stations of the Department in Hawaii and Puerto Rico were established to determine the agricultural possibilities of the two Territories, to improve and diversify their agriculture, and to develop types of agriculture adapted to different regions. The Hawaii Station Act (Act May 16, 1928) and the Puerto Rico Station Act (Act March 4, 1931) provide for the coordination of these stations and their work with the stations of the Territorial agricultural colleges.

1. Federal Experiment Station in Hawaii.--This station at Honolulu, which is now maintained in cooperation with the University of Hawaii, is concerned with problems relating to the diversification of agriculture and the establishment of industries other than sugar and pineapple production. These major industries have their own experiment stations, but close cooperation is maintained with them on problems of mutual interest. Soil and crop work, horticultural investigations, crop utilization, chemical studies of soils, plant breeding, forage-crop studies, dairying, and livestock management constitute the principal activities of the station. These studies are designed to aid the so-called small farmer as contrasted with the plantation system.

Between August 21 and October 24, 1935, the President approved seven Sugar Processing Tax Orders allotting a total of $410,000 to the Hawaii Agricultural Experiment Station of the Department. The allotments were continued by the Supplemental Appropriation Act, fiscal year 1936 (49 Stat., 1116), and are available until expended. These allotments are for taro investigations, liver fluke eradication, a rat-abatement program, development of truck farming and improvement of marketing facilities, development of livestock feed, development of tropical fruits and nuts, and promotion of the poultry industry. The work under the several allotments is being carried out on plans agreed upon by the Hawaiian Agricultural Advisory Committee, the Directors of the Federal and Territorial Agricultural Experiment Stations, and the Chief of the Office of Experiment Stations. During the fiscal year 1936 approximately $124,200 of these funds were expended. The several lines of work will be continued through the fiscal year.

2. Federal Experiment Station in Puerto Rico.--The agricultural experiment station maintained by the Department at Mayaguez, Puerto Rico, since 1902, was established to aid in the improvement and diversification of agriculture in the island. Its principal lines of work have been connected with crop improvement, livestock improvement, introduction of new crops, research on the problems

of coffee, sugarcane, and citrus fruit production, and limited studies of plant diseases, insect pests, animal parasites, soils, and fertilizers for Puerto Rico conditions.

In accordance with the Puerto Rico Experiment Station Act of March 4, 1931, the Territory during the fiscal year 1935 received its first payment ($25,000) under the acts appropriating funds to the State agricultural stations for research. The Act of 1931 authorizes annual increases in the payments to Puerto Rico until 1944, when the amount will equal that which each of the States now receives, - $90,000 annually - the payment to the Territorial station for 1938 being $40,000. With this change in policy, the experiment station maintained by the Territory can gradually assume increasing responsibility for needed research on the problems of concern to Puerto Rico alone. For a few years (until the Territorial station is prepared to take them over) the Department, through its station at Mayaguez, Puerto Rico, will need to continue some lines of investigations for which Puerto Rico agriculture has relied almost wholly upon the Federal station, especially investigations in problems of sugar production, coffee production, animal diseases and parasites, and the introduction of new crop plants.

This change in policy has made possible the designation of the Federal Experiment Station at Mayaguez as a Federal tropical station of the Department of Agriculture, where all bureaus of the Department may be provided with facilities for study of problems requiring research under tropical conditions. This new objective for the station at Mayaguez contemplates centralizing a considerable part of the tropical research of the Department at this station. Until the fiscal year 1934 the station had not been used as such a Federal Department outpost.

The new policy for the Mayaguez station contemplates that a physical plant, including offices, laboratories, houses, and farm equipment, as well as general direction in the carrying out of some phases of the investigations, will be provided by the station. This will provide a station for use by experts of the Department in many lines without the maintenance of separate plants and without the necessity of many agencies arranging for their own facilities at considerable expense due to delays and time involved in becoming acquainted with local conditions.

Under Puerto Rico Tax Fund Order No. 5, approved April 24, 1935 by the President, $113,000 was transferred to the Federal Experiment Station in Puerto Rico for experimentation in the propagation and breeding of tropical plants and studies of domestic animal parasites. This allotment was continued under the Supplemental Appropriation Act, fiscal year 1936, and is available until expended. Six lines of work have been set up under these funds as follows: Drug and insecticidal plants; bamboo utilization and propagation; tropical economic plant introductions and investigations; tropical field crops; tropical horticultural crops; and animal parasitology. The work was begun in 1935 and by the end of the fiscal year 1936 approximately $72,500 had been expended. The work will be continued through 1937 in cooperation with a number of the bureaus of the Department. While planned primarily to benefit Puerto Rican agriculture, this work will contribute to the investigations in the continental United States along similar lines. For example, the work on drug and insecticidal

plants may prove of vital importance to the continental United States in the unsolved problem of securing insecticides and fungicides which will be effective in the control of insect pests and diseases but without leaving residues harmful to humans. This arrangement is, in fact, a carrying out of the provisions of the Puerto Rico Act of March 4, 1931 as to coordination of research in Puerto Rico and, in addition, makes the Federal station in Puerto Rico available as a Federal tropical station of the Department of Agriculture for much needed facilities in connection with some phases of problems for continental agriculture.

A few such problems of the continental United States needing and profiting by research facilities in Puerto Rico are:

(a) The problem of developing insecticides and fungicides effective in controlling insect pests and diseases is a major problem in the United States. Findings of the past three years have indicated the possibility of effective poisons being derived from rotenone and related plant species. Beginning in 1934, the Department undertook additional efforts as to the practicability of producing such plants in quantity and at a cost to furnish insecticides and fungicides within economic limits. It is best done under tropical conditions, and propagation and culture has been centered to a large extent in Puerto Rico. In the neighborhood of 5,000 plants have been sent to the Federal Puerto Rico Station through the Office of Foreign Plant and Seed Introduction of the Bureau of Plant Industry. In Puerto Rico they are being studied as to propagation, culture methods, and content of the drugs desired. This project will need to continue over a number of years. If it is not continued at Puerto Rico, the expense at other places will probably be greater.

(b) Species of chincona, the source of commercial quinine, are being introduced and propagated. Trials are being made in the propagation and spread under forest conditions to study the possibility of developing a supply of quinine in case present market sources are closed.

(c) Puerto Rico offers an opportunity for the introduction and trials of drug plants which may have possibilities later for production in the continental United States. The testing of such plants to select those of commercial possibilities can be done more rapidly under tropical conditions.

(d) In the investigation looking to the control of insect pests, the Department has already found that the ripening of corn every month in the year under Puerto Rican conditions greatly facilitates the studies on corn insects. A similar advantage will be found in studies of truck-crop, cotton,, tobacco, and cane insects. These crops are all grown in Puerto Rico.

(e) For some years the Department has maintained work in the Tropics in connection with sugarcane breeding and improvement for the United States.

Selections of breeding material from all sources can be handled to advantage under tropical conditions in Puerto Rico.

(f) During the past two years the Department has begun certain tropical phases of sweetpotato breeding at the Puerto Rico station. The development of sweetpotato varieties from seed requires such tropical conditions. The Department sends the material to the Puerto Rico station and then arranges cooperative tests and cooperative service within the State agricultural experiment stations. A cooperative agreement is now in effect to render service of this character to Iowa.

(g) The Puerto Rico station has assembled probably the best collection of mangoes and certain other tropical and subtropical varieties in the Western Hemisphere. A representative of the Department's subtropical horticulture in Florida has taken advantage of this collection during the past year in his search for possibilities of crop improvement in Florida and other sections of subtropical agriculture in the United States.

In Puerto Rico two crops of cotton can be grown in a year. This fact will speed up certain phases of cotton breeding.

While the above problems are presented from the standpoint of agriculture in the United States, much of the work would also be helpful to Puerto Rico itself, partly in solving its local agricultural production, and partly, perhaps, in developing new intensive industries, such as drug and insecticidal plants, to supply needs in the United States.

Attention is also called to the fact that the appropriation, through the Office of Experiment Stations, of the Federal Experiment Station in Hawaii will probably be discontinued with the fiscal year 1938. This will mean that all the Federal stations formerly maintained in Alaska, Guam, Hawaii, and Virgin Islands will have been closed, and the only Department station remaining will be the Puerto Rico station. The maintaining of one Department outpost station in the Tropics in behalf of agriculture of the continental United States will greatly facilitate the research work of a number of the bureaus of the Department.

EMERGENCY FUNDS

(1) Direct Allotments

Projects	Obligated, 1936	Estimated obligations, 1937	Estimated obligations, 1938
Territory of Hawaii Trust Funds (Processing Taxes, Sugar): (a)			
Taro Investigations (Hawaii Tax Order No. 4)	$9,428	- - -	- - -
Liver Fluke Eradication (Hawaii Tax Order No. 5)	3,345	- - -	- - -
Rat Abatement Campaign (Hawaii Tax Order No. 6)	981	- - -	- - -
Development of Truck Farming and Improvement of Marketing Facilities (Hawaii Tax Order No. 7)	1,809	- - -	- - -
Development of Live Stock Feed (Hawaii Tax Order No. 8)	116	- - -	- - -
Development of Tropical Fruits and Nuts (Hawaii Tax Order No. 9)	404	- - -	- - -
Promotion of the Poultry Industry (Hawaii Tax Order No. 10)	171	- - -	- - -
Puerto Rico Trust Fund (Processing Taxes): (a)			
Experimentation in the propagation and breeding of tropical plants and studies of domestic animal parasites (Puerto Rico Tax Fund Order No. 5)	31,257	- - -	- - -
Total, Trust Funds (b)	47,511	- - -	- - -
Agricultural Adjustment Administration (transferred to Office of Experiment Stations): (a)			
Payments for Agricultural Adjustment:			
Federal Experiment Station in Hawaii:			
Taro Investigations	17,035	$23,037	$ 500
Liver Fluke Eradication	10,143	26,012	500
Rat Abatement Campaign	38,090	66,929	4,000
Development of Truck Farming and Improvement of Marketing Facilities	15,381	42,809	- - -
Development of Live Stock Feed	10,781	49,102	10,000
Development of Tropical Fruits and Nuts	11,029	38,567	- - -
Promotion of the Poultry Industry	5,473	19,856	4,500

Projects	Obligated, 1936	Estimated obligations, 1937	Estimated obligations, 1938
Federal Experiment Station in Puerto Rico: Experimentation in the propagation and breeding of tropical plants and studies of domestic animal parasites.....	$39,675	$38,000	$2,470
Total, A.A.A. Funds.....	147,607	304,312	21,970

(a) Expenditures under the trust funds ceased January 6, 1936, due to decision of the Supreme Court invalidating the Agricultural Adjustment Act with respect to the collection and use of processing taxes. Sums equal to the unexpended balances on the several tax fund orders were made available under the item "Payments for Agricultural Adjustment," provided by the Supplemental Appropriation Act, fiscal year 1936 (49 Stat., 1116).

(b) Obligations totaling $1,598 were made under Puerto Rico Tax Fund Order No. 5, in the fiscal year 1935.

PASSENGER-CARRYING VEHICLES

The authorization for the purchase of passenger-carrying vehicles for the Office of Experiment Stations contemplates a decrease of $1,525 ($2,250 in 1937, $725 estimated for 1938) for this purpose. This $725 will permit the replacement of one 1931 model automobile. The automobile is needed to afford facilities for the research staff of the Federal Experiment Station in Puerto Rico in conducting the work jointly and in coordination with that of the experiment stations of the College of Agriculture of the University of Puerto Rico. The investigations are located at the Federal station at Mayaguez, the insular stations at Rio Piedras and Isabela, the insular demonstration farms, and other places in the island. The carrying on of the joint research necessitates frequent trips of the Director and other members of the technical staff from Mayaguez to the other stations and to points throughout the island. The poor transportation facilities in Puerto Rico make it essential that automobiles be available so that the research work throughout the island will not be impeded.

SPECIAL RESEARCH FUND, DEPARTMENT OF AGRICULTURE

Appropriation Act, 1937	$800,000
Budget Estimate, 1938	1,200,000
Increase	400,000

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)	Increase
1. Administration of payments to States under Title I, Bankhead-Jones Act	$7,637	$16,000	$24,000	+ $8,000
2. Special research projects, Department of Agriculture	168,339	384,000	576,000	+192,000
3. Special research laboratories in major agricultural regions	199,935	400,000	600,000	+200,000
Transferred for tabulation of unpublished agricultural data to "Census of Agriculture, Bureau of the Census, Department of Commerce"	896	- - -	- - -	- - -
Unobligated balance	23,193	- - -	- - -	- - -
Total appropriation	400,000(a)	800,000	1,200,000	+ 400,000(1)

(a) Appropriated in Second Deficiency Act approved August 12, 1935 (49 Stat.,582)

INCREASE

(1) The increase of $400,000 in this item for 1938 is for the purpose of meeting the authorizations, totaling $1,200,000, provided for by sections 3 and 4 of the Bankhead-Jones Act, approved June 29, 1935 (See Office of Experiment Stations for full text of Title I).

CHANGES IN LANGUAGE

The statute citation has been amended to conform with the latest edition of the U. S. Code.

WORK UNDER THIS APPROPRIATION

General.--The "Special research fund, Department of Agriculture", authorized in sections 3 and 4, Title I of the Bankhead-Jones Act (approved June 29, 1935) provides for (1) administration of the provisions of the Act authorizing payments to States, Hawaii, Alaska, and Puerto Rico for research to be conducted by agricultural experiment stations; (2) special research projects approved by the Secretary of Agriculture and conducted by such agencies of the Department of Agriculture as the Secretary may designate or establish; and (3) the establishment and maintenance of research laboratories and facilities in major agricultural regions of the United States and the prosecution of research at such laboratories. Section 1 of the Act (see Office of Experiment Stations for full text of Title I) specifies that the work conducted under the Special Research Fund shall be "research into laws and principles underlying basic problems of agriculture in its broadest aspects; research relating to the improvement of the quality of, and the development of new and improved methods of production of, distribution of, and new and extended uses and markets for, agricultural commodities and by-products and manufactures thereof; and research relating to the conservation, development, and use of land and water resources for agricultural purposes."

1. Administration of Payments to States under Title I, Bankhead-Jones Act.--The administration of the provisions of the Act, which authorize allotments to the States, Territories, and Puerto Rico, is conducted along the same general lines as that of the previous Acts granting funds to the State experiment stations for research work (Hatch, Adams, and Purnell Acts). Such administration includes examination and approval of research projects in advance of the expenditure of funds, review of the work and expenditures at each station as a basis for certifying the respective States, Territories, or Puerto Rico to receive Federal funds, assistance in coordinating the research of the various stations and the research of the stations with that of the Department, reporting annually to the Secretary and the Congress on the work and expenditures under the Act, and close advisory relations with the State, Territorial, and Puerto Rican stations.

Administration of the payments to States authorized by the Bankhead-Jones Act differs from administration of the other Acts on a number of points including the following:

(a) No allotment of Bankhead-Jones funds can be made to a State, Territory, or Puerto Rico in excess of the amount the State, Territory, or Puerto Rico makes available from other than Federal funds for research during the year. This means a direct important responsibility of administration not included in any of the other Acts.

(b) As a part of their research offset, the States and Territories may include expenditures during the year for physical plant and equipment. This provision also imposes a considerable additional responsibility upon the administration of the Federal grant.

(c) The Bankhead-Jones Act authorizes use of the funds for physical plant, including purchase and rental of land, construction of buildings, and

equipment and maintenance of such buildings. There is no limitation as to the portion of the funds which may be used for these purposes. The expenditures, however, are limited to those necessary for the research under this Act. Administration of this provision is an important responsibility in addition to those required under the other Acts.

2. Special Research Projects, Department of Agriculture.--Approximately one-half of the Special Research Fund is available to the Secretary of Agriculture for financing such research projects as he may authorize, within the scope set forth by Section 1 of the Act. The work under this head includes planning, programming, coordinating, and the carrying out of such special research projects as the Secretary may authorize to be undertaken under this fund in a way to effectively integrate this research with research and other activities provided for in the regular appropriations to the Department, The Act requires that the research under this fund "shall be in addition to research provided for under existing law (but both activities shall be coordinated as far as practicable) and shall be conducted by such agencies of the Department of Agriculture as the Secretary may designate or establish".

All the bureaus of the Department cooperate in bringing before the Secretary problems suitable for research under the provisions of the Bankhead-Jones Act. From the combined suggestions and recommendations, the Secretary, with such advisory assistance as he may call for, selects the problems for research. These problems are assigned to a bureau, or bureaus, or to a group of specialists, for development of plans and estimates for the consideration of the Secretary before final decision is made as to the research to be undertaken. The projects finally decided upon are assigned to an existing bureau, or bureaus, along with an allotment of funds to each bureau. A written project is prepared outlining the research to be undertaken and submitted for approval by the Secretary as required by the Act.

The Office of Experiment Stations is responsible for the development of the program for presentation to the Secretary, for general assistance in planning, directing, and supervising the work, and for the administration of the funds in accordance with the provisions of the Act. A total of 32 projects involving 10 bureaus are under way in 1937. As many as 3 bureaus and 7 State stations are involved in a single project in an effort to coordinate the work with research provided for by other funds as specified in the Act.

3. Special Research Laboratories in Major Agricultural Regions.--The Bankhead-Jones Act provides that the Secretary of Agriculture shall use one-half of the Special Research Fund for the establishment and maintenance of research laboratories and facilities, and for research as described by the Act at such laboratories, at places selected by the Secretary in major agricultural regions. The work under this item involves decision as to problems for which laboratories should be established and planning the research program for each such laboratory; the working out of relationships with the State experiment stations in the major agricultural region having such a laboratory, or where such a laboratory is proposed, in order to coordinate this work with work under regular Federal and State activities; and carrying forward the research program finally approved.

The general plan is to secure from the directors of State experiment stations and the chiefs of bureaus in the Department suggestions as to such laboratories. With this information available the Secretary, with such assistance as he may call for, decides upon the laboratory projects to be undertaken and the agencies of the Department to which the responsibility for each laboratory and the research work will be assigned. It is contemplated that such laboratories will be established and operated in a way that the research undertaken, as far as practicable, will be coordinated with the regular activities of the Department and the work of the State experiment stations.

Three such laboratories were established by the beginning of the fiscal year 1937. One was established in the Corn Belt for soybean research, with particular reference to industrial uses. Two bureaus of the Department and 12 State stations are participating in the coordinated program of research developed around this laboratory project. In a similar way, a coordinated program of research has been developed in connection with a regional laboratory for the study of pasture improvement in the Northeast section of the country. All the State stations of this region are cooperating in this program. A third coordinated program for research in vegetable improvement has been developed in connection with a regional laboratory established in the Southeast section of the United States for the development of improved varieties of vegetables. The States of the Southeastern region are participating in this program. Plans are under way for three additional laboratories to be established during 1937 and probably three more during 1938.

The Office of Experiment Stations is responsible for the development of the laboratory programs in cooperation with bureaus and State stations, to be presented for the consideration of the Secretary, for assistance in the general planning of the work and the development of effective relationships at each laboratory, and for the administration of the laboratories in accordance with the terms of the Act.

PASSENGER-CARRYING VEHICLES

During 1937 it is expected that not more than 12 passenger automobiles will be purchased in connection with activities under the Special Research Fund, 8 for regional laboratory projects under Section 4 of the Bankhead-Jones Act and 4 for projects under Section 1. However, due to the time required for establishment of regional laboratories it is possible that upwards of half of the cars indicated for this class of work will not be needed, and therefore will not be purchased, until early in the fiscal year 1938. In connection with the program of work for 1938, the best estimate that can be made at this time would be for a similar maximum number, although it is expected that the establishment of laboratories will now progress more rapidly and therefore the need for transportation equipment for operating purposes will not lag as may be the case in 1937. All cars purchased are of course subject to the limit of $750 maximum cost applicable to the Government as a whole. At least one car is essential for each regional laboratory and in the case of those established in the larger regions covering a wide area and including work of more than one bureau, two or more cars may be required to enable the technical men to visit the different parts of the regions, including the cooperating State experiment stations. Automobile transportation is essential in connection with field research projects conducted under this fund.

EXTENSION SERVICE

Payments to States, Hawaii, Alaska, and Puerto Rico for Agricultural Extension Work.

General Statement

As shown by Table 1, on the following page, funds available in 1937 for direct payments to the States, Hawaii, Alaska, and Puerto Rico for cooperative agricultural extension work total $17,125,014. In addition, there was available $150,540 from appropriations direct to the Department of Agriculture, making a grand total of $17,275,554 available to the States and Territories for 1937. As shown also by Table 1, the Budget estimates for 1938 provide for total appropriations of $17,540,623 for these purposes, involving a net increase of $265,069, as compared with 1937.

With the exception of the $10,000,000 provided by the Bankhead-Jones Act to augment the cooperative agricultural extension funds, the $500,000 designated for "Additional Cooperative Extension Work", and $50,540 allotted to the States by the Department under "Cooperative Farm Forestry", the major part of extension moneys are distributed on the basis of rural population. Bankhead-Jones funds (with the exception of $20,000 to each State and Hawaii) are allotted on the basis of farm population. The $500,000 appropriation for "Additional Cooperative Extension Work" specifies payment to each State and the Territory of Hawaii in accordance with the apparent need as determined by the Secretary of Agriculture. Funds directly disbursed by the Department, as, for instance, funds for Cooperative Farm Forestry, are also allotted at the discretion of the Secretary.

The use of these funds is indicated in greater detail in Tables 1 and 2. Table No. 2 indicates the funds paid to the States and Territories which require offset by State, county, or local funds, those where such offset is not required, and the basis of allotment.

Table 1.

Statement showing appropriation items and amounts available to the States in 1936, 1937, and estimated for 1938.

	Appropriation 1936	Appropriation 1937	Budget estimate 1938	Increase or Decrease
Payments to States, Hawaii, Alaska, and Puerto Rico for agricultural extension work:				
Permanent Specific Appropriation: Smith-Lever Act	$4,686,096	$4,696,096	$4,701,165	+ $5,069(1)
Agricultural Appropriation Act:				
Supplementary cooperative extension work	1,580,000	1,185,000	790,000	-395,000(2)
Capper-Ketcham extension work	1,480,000	1,480,000	1,480,000	-
Extension work, Section 21, Bankhead-Jones Act	8,000,000	9,000,000	10,000,000	+ 1,000,000(3)
Alaska	12,000	13,918	18,918	+5,000(4)
Additional cooperative extension work	1,000,000	750,000	500,000	- 250,000(5)
Total, Agricultural Appropriation Act	12,072,000	12,428,918	12,788,918	+360,000
Total payments made directly to States and Territories	16,758,096	17,125,014	17,490,083	+ 365,069
Amounts allotted to States and Territories but disbursed by Department of Agriculture:				
Farmers' Cooperative Demonstration Work:				
Cooperative agricultural extension work	145,000	100,000	-	- 100,000(6)
Cooperative Farm Forestry:				
Extension activities in farm forestry	50,540	50,540	50,540	-
Total of direct payments to States and Territories and Department allotments to States and Territories	16,953,636	17,275,554	17,540,623	+ 265,069

(1) $5,069 increase authorized for Puerto Rico by Act of March 4, 1931 (U.S.C., title 7, secs. 386d-386f).

(2) $395,000 decrease in direct payments to the States and Hawaii.

(3) $1,000,000 increase in direct payments to States and Hawaii as authorized for 1938 by Section 21 of the Bankhead-Jones Act (U.S.C. Supp.I, title 7, sec. 343-c).

(4) $5,000 increase for Alaska as authorized by the Act of June 20, 1936(49 Stat., p.1553).

(5) $250,000 decrease in direct payments to the States and Hawaii.

(6) $100,000 decrease involving discontinuance of State allotments, due to necessity for additional funds to provide for essential expenses of the Extension Service incident to the enlarged field program under the provisions of the Bankhead-Jones Act.

Table 2.

Statement of direct payments to States, Hawaii, Alaska, and Puerto Rico, indicating those requiring offset by States and Territories, those not requiring such offset, and basis of distribution, as estimated for 1938.

	Total estimate, 1938	Amount to be paid without offset	Amount requiring offset and basis of allotment	
			Amount	Basis of distribution
(1) Permanent annual appropriation (Smith-Lever Act).....	$4,701,165	$ 500,000(a)	$4,201,165	Rural population
(2) Supplementary cooperative extension work	790,000	---	790,000	" "
(3) Capper-Ketcham extension work.....	1,480,000	980,000(b)	500,000	" "
(4) Extension work, Section 21, Bankhead-Jones Act	10,000,000	10,000,000(c)	---	Farm population
(5) Alaska.....	18,918	15,000(d)	3,918	Rural population
(6) Additional cooperative extension work.....	500,000	500,000	---	Determined by Secretary of Agriculture
Total, direct Federal payments.....	17,490,083	11,995,000	5,495,083	

(a) $10,000 to each State, Hawaii, and Puerto Rico.
(b) $20,000 to each State and Hawaii.
(c) $20,000 to each State and Hawaii (balance; based on farm population).
(d) $10,000 to Alaska (Act of February 23, 1929),
$5,000 to Alaska (Act of June 20, 1936).

Funds from other sources.

The Federal funds for cooperative agricultural extension work are supplemented by funds from within the States estimated at $12,507,459, thus making available from Federal, State, and local sources for extension work during 1937 a sum approximating $29,763,662. (See Table 3).

Table 3. Total allotments to States and Territories from Federal (including U.S.D.A.) and State sources for extension work, fiscal year 1937.

State	Total	Total Federal funds	Total within the States
Alabama	$ 820,117.26	$ 612,024.95	$ 208,092.31
Arizona	166,991.18	116,941.16	50,050.02
Arkansas	785,591.43	528,337,43	257,254.00
California	935,943.79	387,849.93	548,093.86
Colorado	338,221.12	212,151.12	126,070.00
Connecticut	308,091.44	130,819.44	177,272.00
Delaware	93,519.11	74,564.58	18,954.53
Florida	411,507.67	219,363,69	192,143.98
Georgia	1,021,963.79	675,947.47	346,016.32
Idaho	284,793,00	155,754.55	129,038.45
Illinois	1,100,443.97	551,643.52	548,805.45
Indiana	853,428.04	439,542.17	413,885.87
Iowa	1,070,016.71	488,616.20	581,400.51
Kansas	840,076.31	385,349.89	454,726.42
Kentucky	829,265.32	565,718.32	263,547.00
Louisiana	684,816.14	424,513.16	260,302.98
Maine	238,529.58	155,953.51	82,576.07
Maryland	374,688.25	196.893.76	177,794.49
Massachusetts	472,948.77	138,615.88	334,332.89
Michigan	749,945.51	429,003.51	320,942.00
Minnesota	641,581.53	439,487.59	202,093.94
Mississippi	904,528.26	594,836.26	309,692.00
Missouri	746,659.19	556,596.42	190,062.77
Montana	349,071.92	174,443.92	174,628.00
Nebraska	488,637.43	345,248.24	143,389.19
Nevada	129,010.29	73,084.33	55,925.96
New Hampshire	221,909.12	94,725.95	127,183.17
New Jersey	406,608.02	172,701.66	233,906.36
New Mexico	212,822.93	136,397.99	76,424.94
New York	1,593,296.58	474,544.93	1,118,751.65
North Carolina	1,077,022.86	730,481.86	346,541.00
North Dakota	408,338,96	244,973.74	163,365.22
Ohio	979,049.15	551,630.15	427,419.00
Oklahoma	747,504.32	510,373.18	237,131.14
Oregon	432,239.71	186,230.23	246,009.48
Pennsylvania	1,027,242.88	612,093.33	415,149.55
Rhode Island	82,999.10	59,907.83	23,091.27
South Carolina	613,263.92	449,188.92	164,075.00
South Dakota	314,113.17	253,780.24	60,332.93
Tennessee	830,218.24	580,780.60	249,437.64
Texas	1,852,109.39	1,082,935.61	769,173.78
Utah	186,172.41	122,038.41	64,134.00
Vermont	212,083.12	114,263.12	97,820.00
Virginia	862,168.41	504,809.41	357,359.00
Washington	293,372.65	218,487.23	74,885.42
West Virginia	482,862.37	305,939.37	176,923.00
Wisconsin	719,049.95	436,204.95	282,845.00
Wyoming	192,311.28	109,620.20	82,691.08
Alaska	20,318.00	16,318.00	4,000.00
Hawaii	139,285.11	115,055.76	24,229.35
Puerto Rico	216,908.84	99,420.00	117,488.84
Total	29,763,662.50	17,256,203.67	12,507,458.83

As the major purpose of these payments of money to States is the employment of extension workers in counties and colleges, the following comparative statement is submitted showing agents employed:

Table 4. Extension field agents employed June 30, 1933, 1934, 1935, and 1936, and October 31, 1936.

	June 30, 1933	June 30, 1934	June 30, 1935	June 30, 1936	Oct. 31, 1936
State Supervisors	475	512	539	621	625
Subject-Matter Specialists:					
Full-time specialists	863	853	860	1,087	1,150
Part-time specialists	216	258	306	341	301
Special A.A.A. State workers	-	-	95	18	13
Total specialists	1,079	1,111	1,261	1,446	1,464
Total with headquarters at colleges	1,554	1,623	1,800	2,067	2,089
County Workers:					
Agricultural Agents	2,450	3,167	3,290	3,636	3,656
Home demonstration agents	1,221	1,267	1,309	1,688	1,766
Boys' and girls' club agents	201	185	244	315	326
Negro extension agents	314	307	326	396	405
Special A.A.A. county workers	-	-	889	623	614
Total county workers	4,186	4,926	6,058	6,658	6,767
Total	5,740	6,549	7,858	8,725	8,856

Number of counties in United States.....3,075
Approximate number of counties now having one or more agents.....2,880

A discussion of the activities under the various appropriation items and tabulation of amounts involved under each follow:

(a) SUPPLEMENTARY COOPERATIVE EXTENSION WORK
(Supplementary Smith-Lever appropriation)

Appropriation Act, 1937	$1,185,000
Budget Estimate, 1938	790,000
Decrease	395,000

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)	Decrease
Payments to States and Hawaii for cooperative agricultural extension work (Supplementary Smith-Lever).....	$1,580,000	$1,185,000	$790,000	-$395,000(1)

DECREASE

(1) The reduction of $395,000 in this item for 1938 represents a decrease in payments to States and Hawaii for cooperative agricultural extension work. A reduction of 25 percent was made in 1937, and the estimate contemplates a similar reduction for 1938, to be followed by like reductions for 1939 and 1940, the four years during which the increases authorized for extension work under Section 21 of the Bankhead-Jones Act are coming into effect.

CHANGE IN LANGUAGE

The language of this paragraph has been amended by the insertion of the side caption "Supplementary cooperative extension work:" to conform with the plan to identify each appropriation item.

WORK UNDER THIS APPROPRIATION

These funds supplement the permanent annual appropriation provided under the Smith-Lever Act of May 8, 1914 (U.S.C., title 7, secs. 341-348). Like the Smith-Lever funds, they are paid directly to the State colleges of agriculture as Federal aid for the promotion of extension work in agriculture and home economics. This appropriation is divided among the States and Hawaii on the basis of rural population and the funds must be met dollar for dollar. The item contains a provision that not more than $300,000 may be expended for purposes other than salaries of extension agents in counties. As $300,000 is approximately 37 percent of the total appropriation, this means that approximately 63 percent of the funds must be expended for salaries of county extension agents.

The State allotments are paid directly to a designated officer in the State and are disbursed in accordance with budgets and programs of work submitted by the State directors of extension and approved by the Secretary of Agriculture. Expenditures by the States from this and other cooperative extension appropriations are subject to an annual inspection by representatives of the Department.

(b) CAPPER-KETCHAM EXTENSION WORK

Appropriation Act, 1937.....	$ 1,480,000
Budget Estimate, 1938.....	1,480,000

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)
Payments to States and Hawaii for further development of cooperative agricultural extension work (Capper-Ketcham Act).....	$1,480,000	$1,480,000	$1,480,000

CHANGE IN LANGUAGE

The language of this paragraph has been amended by the insertion of the side title "Capper-Ketcham extension work:" to conform with the plan to identify each appropriation item.

WORK UNDER THIS APPROPRIATION

This appropriation is specifically authorized by the provisions of the Capper-Ketcham Act of May 22, 1928 (U.S.C., title 7, secs. 343a, 343b), which authorizes an appropriation of $980,000 to be divided at the rate of $20,000 to each State and to Hawaii, without requirement for State and Territorial offset; and an additional $500,000 to be divided among the States and Hawaii on the basis of rural population, the allotments from this additional $500,000 to be met dollar for dollar by the States or Territory before the money becomes available. The Act further provides that at least 80 percent of the funds appropriated under this authorization shall be expended for salaries of county extension agents and that the extension agents appointed under its provisions shall be men and women in fair and just proportions.

The State allotments are paid directly to a designated officer in the State and are disbursed in accordance with budgets and programs of work submitted by the State directors of extension and approved by the Secretary of Agriculture. Expenditures by the States from this and other cooperative extension appropriations are subject to an annual inspection by representatives of the Department.

(c) EXTENSION WORK, SECTION 21, BANKHEAD-JONES ACT

Appropriation Act, 1937.....	$9,000,000
Budget Estimate, 1938.....	10,000,000
Increase.....	1,000,000

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)	Increase
Payments to States and Hawaii for cooperative agricultural extension work (Bankhead-Jones Act)	$8,000,000	$9,000,000	$10,000,000	+$1,000,000(1)

INCREASE

(1) The increase of $1,000,000 in this item for 1938 is authorized for extension work under Section 21 of the Bankhead-Jones Act of June 29, 1935, and is needed to provide additional personnel and other expenses in the various States and Hawaii in order that extension work may be available to all rural people and to enable the Cooperative extension service in the States to carry the greatly increased burden of work resulting from the assistance requested of the Extension Service by the Federal agencies created in recent years.

CHANGES IN LANGUAGE

The language of this paragraph has been amended as follows:

> The words, "Extension work, Section 21, Bankhead-Jones Act:" are inserted as a side title to conform with the plan to identify each appropriation item.
>
> For reference to the Statutes at Large "(49 Stat., pp. 436-439)" has been substituted the latest code citation to the Act--"(U.S.C., Supp. I, title 7, sec. 343c)".

WORK UNDER THIS APPROPRIATION

This appropriation is specifically authorized by the provisions of Title II, Section 21, of the Bankhead-Jones Act of June 29, 1935 (U.S.C., Supp. I, title 7, Sec. 343c) and augments the cooperative agricultural extension funds provided under the permanent Smith-Lever Act, the Capper-Ketcham Act, and supplementary extension appropriations by $8,000,000 for the fiscal year 1936, increased to $9,000,000 for 1937, with increases of $1,000,000 a year authorized for each of the succeeding three years, making the final total amount to be appropriated to the land-grant colleges for cooperative agricultural extension work under this Act $12,000,000 in the fiscal year 1940 and a like amount for each fiscal year thereafter. The funds are available to the States only after they have met the required State offset to funds provided under the permanent Smith-Lever Act, the Capper-Ketcham Act, and supplementary cooperative extension work appropriations.

Under the Bankhead-Jones Act $20,000 is allotted to each State and to Hawaii, The remainder of the fund is then allotted each State and Hawaii on the basis of farm population. This fund enables the Extension Service to assist other Federal agencies with educational work in agriculture and home economics, agricultural economics, and 4-H club work, as well as other phases of extension. No State offset is required for any of the funds under this Act.

The State allotments are paid directly to a designated officer in the State and are disbursed in accordance with budgets and programs of work submitted by the State directors of extension and approved by the Secretary of Agriculture. Expenditures by the States from this and other cooperative extension appropriations are subject to an annual inspection by representatives of the Department.

(d) ALASKA

Appropriation Act, 1937	$13,918
Budget Estimate, 1938	18,918
Increase	5,000

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)	Increase
1.Extension of the Smith-Lever Act to Alaska...	$12,000	$13,918	$13,918	---
2.Extension of the Capper-Ketcham Act to Alaska..	---	---	5,000	+$5,000 (1)
Total appropriation	12,000	13,918	18,918	+5,000 (1)

INCREASE

(1) The increase of $5,000 for 1938 is the amount authorized by the Acts of June 20, 1936 extending the provisions of the Capper-Ketcham Act to the Territory of Alaska. At the present time the extension staff in Alaska consists of only one full-time agricultural agent, one full-time home economics agent, and one part-time extension veterinarian, the latter giving special service to Alaska fur farmers. Because of the vast distances in Alaska, additional extension agents are needed so that the Territory may be divided and the work in the various districts be made more intensive. Funds for travel are also inadequate and need to be increased, so that visits to isolated communities may be more frequent. It is desirable, also, that some funds be made available to the Extension Service for financial cooperation in educational extension work with the resettlement colonists at Palmer. The $5,000 authorized is urgently needed for 1938.

CHANGE IN LANGUAGE

The phraseology of this paragraph has been amended by the addition of appropriate language necessitated by the passage of the Act of June 20, 1936.

WORK UNDER THIS APPROPRIATION

General.-- The provisions of the Smith-Lever Act of 1914 and the Capper-Ketcham Act of 1928 were extended to Alaska by special acts of Congress. The extension work in agriculture and home economics is of a similar nature to that which is being conducted in the States, modifications being made to suit local conditions. Experiment stations have been maintained in Alaska for many years, but extension work was not systematically begun among farmers until 1931. The allotments are paid directly to a designated officer in the Territory and are disbursed in accordance with budgets and plans of work submitted by the director of extension and approved by the Secretary of Agriculture. Expenditures are subject to inspection by representatives of the Department.

1. Extension of the Smith-Lever Act to Alaska.--The extension of the Smith-Lever Act to Alaska is specifically authorized by the Act approved February 23, 1929 (U.S.C., title 7, sec. 386c). Under the provisions of this Act, $10,000 is appropriated annually to Alaska without requirement of Territorial offset, and the remainder, $3,918, must be matched by Territorial funds used for extension work.

2. Extension of the Capper-Ketcham Act to Alaska.--The extension of the Capper-Ketcham Act is specifically authorized by the Act approved June 20, 1936 (49 Stat., p. 1553). The amount authorized for Alaska was $2,500 for the fiscal year 1937, but this amount was not appropriated due to adjournment of Congress. The amount authorized to be appropriated for the fiscal year 1938 is $5,000, to be increased by $2,500 annually until a total of $10,000 is reached. The Act carries a proviso that no appropriation shall be made thereunder until an annual estimate as to funds and amounts has been made by the Secretary of Agriculture, such estimate to be based upon his determination of the ability of the Territory of Alaska to make effective use of the funds. It also provides that, "whereas the Capper-Ketcham Act provides that 'at least 80 per centum of all appropriations under this Act shall be utilized for the payment of salaries of extension agents in counties of the several States to further develop the cooperative extension system in agriculture and home economics with men, women, boys, and girls', the several established judicial divisions of the Territory of Alaska, as the same shall exist from time to time, shall be considered as counties for the purpose of complying with the provisions of this Act until a subdivision of the Territory of Alaska into counties, is effected."

(e) ADDITIONAL COOPERATIVE EXTENSION WORK

Appropriation Act, 1937	$ 750,000
Budget Estimate, 1938	500,000
Decrease	250,000

Projects	1936	1937 (Estimated)	1938 (Estimated)	Decrease
Payments to States and Hawaii for additional cooperative agricultural extension work	$1,000,000	$750,000	$500,000	-$250,000(1)

DECREASE

(1) The reduction of $250,000 in this item for 1938 represents a decrease in direct payments to States and Hawaii. A reduction of 25 percent was made for 1937, and the estimate contemplates a similar reduction for 1938, to be followed by like reductions for 1939 and 1940, the four years during which the increases authorized by the Bankhead-Jones Act are coming into effect.

CHANGES IN LANGUAGE

The language of this paragraph has been amended as follows:

The word "agricultural" in the side title has been omitted. As amended, it will read: "Additional cooperative extension work:".

The following proviso has been omitted:

Provided, That for the fiscal year 1937 the Secretary is authorized and directed to so allot this appropriation to the several States that, taken into consideration with the allotments of other Federal funds appropriated for payments to States for cooperative extension work, the total allotment to each State from all funds so appropriated shall not be less than for the fiscal year 1936.

The Department has no objection to the retention of this proviso in its present form, but it is considered unnecessary since its requirements would normally be followed in making allotments to States.

WORK UNDER THIS APPROPRIATION

These funds supplement the permanent specific appropriation provided under the Smith-Lever Act, approved May 8, 1914 (U.S.C., title 7, secs. 341-348), as well as those funds provided under the Capper-Ketcham Act, approved May 22, 1928 (U.S.C., title 7, secs. 343a, 343b). The appropriation provides for additional cooperative extension work, including the employment of specialists in economics and marketing. These funds are to be allotted by the Secretary of Agriculture to the several States and the Territory of Hawaii in such amounts as he may deem necessary to accomplish such purposes. Like the Smith-Lever Act and the Capper-Ketcham Act funds, they are paid directly to the State colleges of agriculture as Federal aid for extension work in agriculture and home economics. However, as already indicated, the payments of funds to the States, instead of being based upon rural population, are subject to determination by the Secretary of Agriculture as to the amount that he may deem necessary to accomplish the best results in each State.

The State allotments are paid directly to a designated officer in the State and are disbursed in accordance with budgets and programs of work submitted by the State directors of extension and approved by the Secretary of Agriculture. Expenditures by the States from this and other cooperative extension appropriations are subject to an annual inspection by representatives of the Department.

EMERGENCY FUNDS

Direct Allotment

Projects	Obligated, 1936	Estimated obligations, 1937
Emergency Relief Appropriation Act, 1935:		
Wind Erosion Control in Southern Great Plains Area: Allotment authorized by Sec. 4 of Soil Conservation and Domestic Allotment Act of Feb. 29, 1936 (for apportionment to States in the southern plains area for wind-erosion control)----------	$1,950,000	$50,000

WORK UNDER THIS ALLOTMENT

Because of the serious situation existing in the southern Great Plains area due to soil blowing and wind erosion, and the great need for emergency measures to check this condition in order to conserve the land, $2,000,000 was made available to the Secretary of Agriculture by Section 4 of the Act of February 29, 1936 (Public No. 461, 74th Congress), under an allotment provided by the Emergency Relief Appropriation Act of 1935, for allocation and payment to the States in this area for wind erosion control. Of this amount, $1,950,000 was allocated in 1936 to the five States affected--Colorado, Kansas, Oklahoma, New Mexico, and Texas--and $50,000 remained--available for obligation in 1937.

Under plans approved by the Secretary, a State Wind Erosion Control Committee has been set up in each State, the chairman of which is responsible for the safekeeping and distribution of funds, and County Wind Erosion Control Committees have been organized in the various counties. Through this machinery, grants are made to individual farmers upon specified terms and conditions for the purpose of listing and otherwise preparing their land to control wind erosion. Each State chairman is required, on or before June 30, 1937, to make return to the Secretary of Agriculture, for deposit in the United States Treasury, of all unexpended or nonobligated funds from his State allotment.

Direct Appropriations to the Department

(f) GENERAL ADMINISTRATIVE EXPENSES

Appropriation Act, 1937	$126,246
Allotment from "Salaries, Office of Secretary"	9,000(a)
Total available, 1937	135,246
Budget Estimate, 1938	135,246

(a) Transferred to this heading in Estimates for 1938 and Secretary's Office reduced accordingly.

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)
General administration and business service	$134,851	$135,246	$135,246
Unobligated balance	395	- - -	- - -
Total appropriation	135,246(a)	135,246	135,246

(a) For 1936 includes allotment of $112,578 from "Farmers Cooperative Demonstration Work" transferred to this item in the appropriation for 1937 and $9,000 from "Salaries, Office of Secretary" proposed to be transferred in 1938.

WORK UNDER THIS APPROPRIATION

This appropriation provides the Director of Extension Work with personnel and funds essential to the proper supervision and general business operations of the Extension Service, comprising the Office of the Director, Division of Cooperative Extension, Division of Motion Pictures, Division of Exhibits, and a large cooperative field force. The funds for payment of the salary of the Director of Extension, heretofore carried by the appropriation for "Salaries, Office of the Secretary" are proposed for transfer to this heading in 1938.

(g) FARMERS' COOPERATIVE DEMONSTRATION WORK

Appropriation Act, 1937.....$554,670
Budget Estimate, 1938.....554,670

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)	Increase or decrease
1. Technical advice and assistance in subject-matter fields to State extension forces.....	$290,386	$324,670	$409,670	+$85,000(1)
2. Studies of extension methods and assistance in training courses for State extension forces..	46,658	55,000	60,000	+ 5,000(1)
3. Preparation and distribution of visual material and extension literature to Department and State extension forces.....	65,272	75,000	85,000	+ 10,000(1)
4. Allotments to States for cooperative agricultural extension work.....	141,899	100,000	----	-100,000(1)
Unobligated balance.....	11,455	----	----	----
Total appropriation....	555,670(a)	554,670	554,670	(1)

(a) For 1936, excludes allotments of $112,578 to "General Administrative Expenses" and $79,000 to "Motion Pictures", which items were transferred to these respective headings in the appropriation for 1937.

There is no change in the total of this item for 1938 as compared with 1937. Adjustments between the projects have been made, however, as indicated in the Project Statement. These adjustments are necessary in order to provide professional and clerical assistance urgently needed for supervision of increased extension work. During the fiscal years 1936 and 1937 annual funds for direct payment to the States and Hawaii increased $9,000,000 under the item "Extension work, Section 21, Bankhead-Jones Act", but no provision was made for the resulting increase in essential supervisory duties, travel, and supplies, and the Extension Service has been seriously handicapped by lack of personnel for supervision, advice, and assistance to extension field workers.

WORK UNDER THIS APPROPRIATION

General.-- This item provides funds for the administration of cooperative extension work conducted in the continental United States and the Territories of Alaska, Hawaii, and Puerto Rico, and for the maintenance of the necessary professional and clerical staffs in the District of Columbia. The appropriation is, therefore, a very necessary and vital part of the cooperative agricultural extension system.

1. Technical Advice and Assistance in Subject-Matter Fields to State Extension Forces.-- This project covers the cost of maintenance of four regional administration sections (North Central, Northeastern, South, and Western), a section of subject-matter specialists, and a section of agricultural economists. The staff of the regional sections is essential to the efficient field administration of extension work, the inspection of expenditures under Federal grants in various States, and the coordination of all extension work in the field. The subject-matter specialists and economic extension staff carry to the State extension services the findings of the research bureaus of the Federal Department and assist them to incorporate such facts in their State programs. They carry information of value also, from State to State, along the lines of agriculture and home economics.

2. Studies of Extension Methods and Assistance in Training Courses for State Extension Forces. -- The work under this project is very essential as the Extension Service originates, plans, and conducts, in cooperation with other sections of the Federal extension service and the various State extension services, field and office studies aimed at the development of a scientific body of information which will aid in the further development of agricultural extension, home economics extension, and boys' and girls' 4-H Club work and increase the efficiency of extension workers engaged in these lines of work; promotes and assists the development of more adequate professional training of extension workers -- both for those planning to enter the work and for those already in the service; records and measures the accomplishments of the cooperative extension system; and analyzes and interprets the results obtained in terms of teaching activities and educational progress.

3. Preparation and Distribution of Visual Material and Extension Literature to Department and State Extension Forces. -- Under this project the Extension Service maintains such activities as its photographic library, editorial unit, radio programs, writers for the preparation of special educational material, lantern slides and film strips, and similar informational functions. Service in connection with information and illustrative material is rendered to the approximately 8,000 extension field workers. All annual reports and similar data are prepared under this project.

4. Allotments to States for Cooperative Agricultural Extension Work. -- Under this project funds have been made available to the various States, Hawaii, and Puerto Rico to supplement salaries of field extension workers. These allotments will be discontinued for 1938, due to increased needs for funds in other projects of vital importance to the efficient administration of field activities under the increased funds provided for direct payment to the States.

EMERGENCY FUNDS

Direct Allotments

Projects	Obligated, 1936	Estimated obligations, 1937	Estimated obligations, 1938
Agricultural Adjustment Administration (transferred to Extension Service):			
1. Salaries and Expenses:			
For the services of an extension economist to assist in the formulating of marketing agreements and in the educational and administrative work in connection therewith in the field, as related to the programs of the A.A.A.....	$6,600	$6,600	$6,600
Clerical assistance in connection with certain informational activities as related to the programs of the A.A.A.....	1,800	5,040	5,040
Total, Salaries and Expenses...	8,400	11,640	11,640
2. Advances to A.A.A.:			
Combined commodity budget (cotton, wheat, tobacco, corn and hogs, sugar, peanuts, and rice): For the employment of emergency agents, clerks, etc., and for travel expenses, telegraph, etc., necessary to conduct an educational campaign for the control of cotton, corn, tobacco, wheat, sugar, peanut, and rice acreages, and in the production of hogs.....	1,071,609	---	---
For the employment of tobacco committeemen to assist in contacting growers in connection with regular tobacco programs (cigar leaf and flue-cured).....	22,458	---	---
For the employment of committeemen and/or compliance supervisors for carrying out the plans of the sign-up campaign and the checking of farms for compliance in connection with the peanut production adjustment program.....	110,338	---	---
For the employment of necessary field personnel to assist in contacting rice producers in connection with the rice acreage reduction campaign in Arkansas, Louisiana, Texas, and California.....	58,815	---	---

EMERGENCY FUNDS - Continued

Direct Allotments - Continued

Projects	Obligated, 1936	Estimated obligations, 1937	Estimated obligations, 1938
Agricultural Adjustment Administration (transferred to Extension Service)--Continued.			
2. Advances to A.A.A.--Continued.			
For supervision of the measurement of land planted to cotton under contract during 1935 and for the employment of supervisors, local supervisors, and clerical help incident to the measurement, computing areas, and completing compliance forms in connection with such contracts in order to carry out the provisions of the 1934-1935 cotton acreage reduction programs.	$1,975,683	----	----
For the employment of tobacco appraisers in cigar-leaf producing States and supervisors in both the flue-cured and cigar-leaf tobacco producing States for compliance work in tobacco adjustment programs.	118,584	----	----
For the employment of field personnel to contact sugarcane producers in connection with the sugarcane for sirup programs.....	5,365	----	----
Total, Advances to A.A.A.....	3,362,852	----	----
3. Administration of Cotton Act of 1934: For the employment of the field service personnel required and all extra expense necessary to carry out the provisions of the Cotton Act for the crop year.....	2,251,306	----	----
4. Advances under Tobacco Act: For the employment of committeemen and/or clerks to assist in the administration of the Kerr-Smith Tobacco Act.....	137,000	----	----
5. General Expenses: To enable various State extension services to complete cattle purchase reports and related material required in connection with the 1934-1935 cattle purchase relief program not completed by June 30, 1935.....	23,000	----	----

EMERGENCY FUNDS -- Continued.

Direct Allotments - Continued.

Projects	Obligated, 1936	Estimated obligations, 1937	Estimated obligations, 1938
Agricultural Adjustment Administration (transferred to Extension Service)--Continued.			
6. Payments for Agricultural Adjustment: For salaries and miscellaneous expenses incident to the administration of the extension phases of activities surrounding the completion of all commodity programs in Washington and the field.....	$622,475	$177,525	----
For payment of outstanding obligations incurred under authority of previous Exhibit A's as approved by the A.A.A., funds for which ceased to be available on January 6, 1936.....	500,000	----	----
Total, Payments for Agricultural Adjustment.....	1,122,475	177,525	----
7. Exportation and Domestic Consumption of Agricultural Commodities (Cotton Price Adjustment): For special assistance to State extension forces in connection with the details of administration incident to receiving and approving applications from cotton producers for participation in the adjustment price payment on cotton and for the employment, supervision, and certification of service of the field personnel required, the rental or purchase of equipment, supplies, rental of office space, telephone and telegraph charges, and freight and express charges in connection with the adjustment price payment on cotton.....	1,585,000	448,444	----
8. Payments for Agricultural Adjustment (Payments under Tobacco, Cotton, and Potato Acts): For payment of obligations incurred by State extension forces in administration of the Bankhead Cotton program (1936).....	650,000	----	----
Total, A.A.A. Funds.....	9,140,033	637,609	$11,640

EMERGENCY FUNDS -- Continued

Direct Allotments - Continued

Projects	Obligated, 1936	Estimated obligations, 1937	Estimated obligations, 1938
Conservation and Use of Agricultural Land Resources, Department of Agriculture (transferred to Extension Service):			
For cooperation with Federal and State extension services in carrying out a program planning and discussion project in States and counties in connection with the soil conservation and domestic allotment program.....	$75,000	$215,500	$215,500
For the employment of assistants to county agricultural agents in nine Southern States to cooperate with the State extension services in the payment of salary and/or expenses of State extension employees engaged in handling the details connected with the administration of the agricultural conservation program administered by the Agricultural Adjustment Administration.....	----	613,500	338,500
For payment of salaries and/or expenses incurred by State extension employees engaged in handling details connected with the furtherance of the agricultural conservation programs.....	----	50,704	----
Total, Conservation and Use of Agricultural Land Resources....	75,000	879,704	554,000
Total, Emergency Funds (Direct Allotments)	9,215,033	1,517,313	565,640

WORK DONE UNDER AGRICULTURAL ADJUSTMENT ADMINISTRATION AND OTHER EMERGENCY FUNDS.

With the inauguration of agricultural adjustment and certain other emergency programs affecting rural life, the Extension Service became immediately the agency through which educational and/or informational facts were made available to the farmers and other rural people concerned. Funds were transferred for necessary expansion of personnel and other additional expenses both in Washington and the field. In addition to appropriations for enlarging the number of county agricultural agents, allotments for employing county committeemen to assist the agents in contacting growers constituted a very large percentage of the total funds made available.

The passage of the Bankhead-Jones Act (U.S.C. Supp.I, title 7, Sec. 343c) on June 29, 1935, which Act provided for $8,000,000 in additional Federal funds for direct payment to the States, greatly reduced the transfers of Agricultural Adjustment Administration funds to the Extension Service, and, since the Act authorizes additional funds annually until a total of $12,000,000 is reached, the transfers during 1937 total only about a million and a half dollars, with the probability that not to exceed $500,000 will be required for 1938.

Detailed explanation of the purposes for which funds were transferred during 1936 and 1937, and estimated transfers for 1938, are given on the pages immediately preceding.

(h) MOTION PICTURES

Appropriation Act, 1937..... $79,000
Budget Estimate, 1938..... 79,000

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)
1. Preparation of motion pictures	$69,217	$58,844	$58,844
2. Distribution of motion pictures	8,160	20,156	20,156
Unobligated balance.....	1,623	---	---
Total appropriation.....	79,000(a)	79,000	79,000

(a) For 1936 includes allotment of $79,000 from "Farmers' Cooperative Demonstration Work", transferred to this heading in appropriation act for 1937.

WORK UNDER THIS APPROPRIATION

General.-- These funds meet the expenses incident to the maintenance of a laboratory for the production of motion pictures as a means of disseminating information on the results of scientific research of the various bureaus of the Department and to teach improved methods and practices in agriculture, forestry, conservation, rural engineering, home economics, and kindred subjects.

Preparation of Motion Pictures.-- Under this project the actual production costs of manufacturing motion pictures are provided. In cooperation with the various bureaus of the Department, scenarios and other details are worked out. Trained personnel is provided for making the necessary pictures and for development, processing, and other steps essential to the completion of the films. Traveling expenses incident to the actual photographic work and funds for the transportation of equipment are also provided under this project.

Distribution of Motion Pictures. -- Under this project funds are made available for the actual distribution of the completed films. Necessary personnel is provided in Washington, D.C., to maintain records and to distribute films. Notifications of the release of films are prepared and catalogues and other necessary information furnished. Films are loaned to the 8,000 extension workers on request and to other educational agencies.

(i) AGRICULTURAL EXHIBITS AT FAIRS

Appropriation Act, 1937..... $85,000
Budget Estimate, 1938..... 85,000

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)
1. Preparation of agricultural exhibits to be shown at fairs.....	$45,695	$42,693	$42,693
2. Exhibition of agricultural exhibits at fairs.....	39,063	42,307	42,307
Unobligated balance.....	242	---	---
	85,000	85,000	85,000

WORK UNDER THIS APPROPRIATION

General.-This appropriation item affords the means by which the Department provides the public with agricultural information in exhibit form which has come to be recognized as one of the important teaching methods. It also enables the Department, through the maintenance of a trained staff, to coordinate the general exhibits work of its bureaus. The activity is carried on through a cooperative arrangement with State and interstate fairs within the United States. The Department furnishes the exhibits and personnel for management and demonstration, and the fairs pay a share of the cost of transporting exhibits, furnish exhibition space free, pay drayage and labor for unloading and reloading cars at exhibition points, common labor for unpacking, installing, dismantling, and repacking the exhibits, and janitor, watchman, electrical, and such other special services as are necessary to accomplish creditable display. The appropriation is used for projects as follows:

1. Preparation of Agricultural Exhibits to be Shown at Fairs.-- Work under this project consists of the planning and preparing of agricultural exhibits, involving (a) investigations of materials and methods and principles useful in exhibit work; (b) an analysis of exhibit proposals, consultation with subject-matter specialists, determination of the form of presentation, and preparation of exhibit designs and building plans; and (c) construction and maintenance of exhibits, involving the development of mechanical appliances, electrical devices, art work, modeling, and lettering.

2. Exhibition of Agricultural Exhibits at Fairs. -- Work under this project consists of negotiating financial and cooperative agreements with fairs, Government departments and bureaus, railroads, associations, organizations, and other agencies for the movement, installation, display, and demonstration of educational exhibits at about seventy-five exhibitions each year, direction and management of such exhibitions, and the warehousing, shipment, return, and care of a vast number of educational exhibits.

(j) CALIFORNIA PACIFIC INTERNATIONAL EXPOSITION

(Transfer to Agriculture, Act of March 7, 1935, Amended by Act of February 11, 1936).

A total of $24,500 was transferred to the Extension Service for participation in the California Pacific International Exposition held in San Diego, California, in 1935 and continuing to January 1, 1937.

This transfer was for the purpose of employing personnel, purchasing materials, and the making of contracts necessary in designing, preparing, and assembling educational exhibits, portraying activities of the Department of Agriculture, and installing, demonstrating, and maintaining these exhibits at the California Pacific International Exposition, San Diego, California, and for their return to the custody of the Department and restoration to such condition as to permit their use at subsequent occasions.

(k) TEXAS CENTENNIAL EXPOSITION

(Transfer to Agriculture, Act of August 12, 1935).

A transfer of $80,000 was made to the Extension Service for participation in the Texas Centennial Exposition held in Dallas, Texas, during the years 1936 and 1937.

This transfer was for the purpose of employing personnel, purchasing materials, and the making of contracts necessary in designing, preparing, assembling, transporting, installing, demonstrating, and arranging for the safekeeping of the Department's exhibits at the Texas Centennial Exposition and their return to the custody of the Department and restoration to such condition as to permit their use at subsequent expositions and fairs.

(l) GREAT LAKES EXPOSITION

(Transfer to Agriculture, Act of May 15, 1936).

A transfer of $10,000 was made to the Extension Service for participation in the Great Lakes Exposition, Cleveland, Ohio, during the years of 1936 and 1937.

This transfer was for the purpose of employing personnel, purchasing materials, and the making of contracts necessary in assembling, transporting, installing, demonstrating, and arranging for the safekeeping of the Department's exhibits at the Great Lakes Exposition and their return to the custody of the Department.

EMERGENCY FUNDS

Direct Allotment

Projects	Obligated, 1936	Estimated obligations, 1937
Agricultural Adjustment Administration (transferred to Extension Service):		
Salaries and Expenses:		
For participation in the live-bird and educational exhibit at the Sixth World's Poultry Congress held in Leipzig, Germany..	----	$10,000
Emergency Relief Appropriation Act of 1935:		
For renovating and rebuilding agricultural exhibits; classifying, listing, and describing complete exhibits and salvaged materials; rearrangement of exhibits and salvaged materials in the warehouse to create more space to facilitate construction work, and shipments and the erection of certain partitions to improve working conditions.....	$4,059	----
Total, Emergency Funds (Direct Allotments)....	4,059	10,000

(m) COOPERATIVE FARM FORESTRY

Appropriation Act, 1937.....$56,838
Budget Estimate, 1938..... 56,838

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)
1. Technical advice and assistance in farm forestry to State extension forces.....	$6,132	$6,298	$6,298
2. Allotments to States for cooperative farm forestry.....	48,502	50,540	50,540
Unobligated balance.....	2,204	----	----
Total appropriation,.....	56,838	56,838	56,838

WORK UNDER THIS APPROPRIATION

General. -- Section 5 of the Clarke-McNary Forestry Act of June 7, 1924 authorizes an appropriation for the promotion of educational work with farm people in establishing, improving, and renewing woodlots, shelterbelts, windbreaks, and other valuable forest growth and in growing and renewing useful timber crops. The bulk of the appropriation is allotted to the States and

Territories in such amounts as the Secretary of Agriculture may determine upon or as may be agreed upon with the States, provided the States expend an equal amount for a like purpose. The project in the States usually is made in cooperation with the State forestry department but is administered by the State agricultural extension director of the land-grant college as a definite part of the cooperative agricultural extension system of each such institution.

1. Technical Advice and Assistance in Farm Forestry to State Extension Forces. -- This project covers the cost of the employment of one extension forester specialist in Washington to coordinate extension activities in farm forestry in the field. He cooperates with the Federal Forest Service and is responsible to that service for the information on all phases of forestry which he carries to the States and to the Federal Extension Service for his contacts with the extension forces in the field. The extension forester assists the State extension services to incorporate the practical results of the research findings of the Federal Department in their State extension forestry programs and carries information in improved forestry and gathers information as he travels from State to State. This specialist also prepares forestry extension literature, makes talks and radio addresses, and otherwise promotes better forestry practices.

2. Allotments to States for Cooperative Farm Forestry. -- Under this project funds are used for cooperation with the States in the employment of extension foresters. The usual arrangement is for the Federal Government to contribute toward the salary of the extension forester, the State providing for the remainder of his salary, State travel expenses, clerical help, and other necessary expenses. Usually the State contribution is considerably more than that of the Federal Government. At present this cooperative arrangement is in effect with 33 States and Puerto Rico. A very large part of the farm acreage of the United States is in woodland, and much of the income of the farmers in certain sections, particularly the Northeastern and Southern States, is from forest products. County agents generally are not trained in forest management and need the assistance of farm forestry specialists in strengthening their work in this field. The extension forester arranges demonstrations in woodlot management, selection of trees for cutting, estimating of merchantable timber, and in other fields. In many States the extension forester is also active in assisting farmers in forest planting plans and in interesting members of boys' and girls' clubs in tree planting. The allotments to the States and Puerto Rico for the fiscal year 1937 are as follows:

Alabama	$1,620	New Hampshire	$1,620
California	1,620	New Jersey	1,620
Colorado	900	New York	1,620
Connecticut	1,020	North Carolina	1,620
Georgia	1,620	North Dakota	1,260
Idaho	1,620	Ohio	1,440
Illinois	1,620	Pennsylvania	1,260
Indiana	1,620	Tennessee	1,620
Iowa	1,620	Texas	1,620
Kansas	1,020	Utah	1,080
Louisiana	1,620	Vermont	1,620
Maryland	1,620	Virginia	1,620
Massachusetts	1,620	West Virginia	1,620
Michigan	1,620	Wisconsin	1,620
Minnesota	1,620	Wyoming	1,260
Mississippi	1,620	Puerto Rico	1,620
Montana	800		
Nebraska	1,620	Total allotments	50,540

(n) COOPERATIVE AGRICULTURAL EXTENSION WORK
(Permanent Annual Smith-Lever Appropriation)

Appropriation Act, 1937	$4,696,096
Budget Estimate, 1938	4,701,165
Increase	5,069

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)	Increase
Payments to States, Hawaii, and Puerto Rico for cooperative agricultural extension work (Smith-Lever Act)	$4,686,096	$4,696,096	$4,701,165	5,069(1)

INCREASE

(1) The increase of $5,069 in this item for 1938 represents the annual increment for Puerto Rico authorized by the Act of March 4, 1931 (U.S.C., title 7, secs. 386d-386f), extending the benefits of the Smith-Lever Act to Puerto Rico. With the provision for this increase in funds, the maximum amount available to Puerto Rico under that Act will have been reached during the fiscal year 1938.

WORK UNDER THIS APPROPRIATION

This is the permanent specific appropriation for cooperative agricultural extension work provided in the Smith-Lever Act, approved May 8, 1914 (U.S.C. title 7, secs. 341-348), as amended by the extension of this Act to the Territory of Hawaii by the Act of May 16, 1928 (U.S.C., title 7, secs. 386-386b) and to Puerto Rico by the Act of March 4, 1931 (U.S.C., title 7, secs. 386d-386f). Under the provisions of these Acts, $10,000 is appropriated annually to each State, Hawaii, and Puerto Rico without requirements of State or Territorial offset, the remainder of the appropriation being distributed on the basis of rural population. This is the basic act under which cooperative extension work is conducted by the Department and the State colleges of agriculture.

The State allotments are paid directly to a designated officer in the State and are disbursed in accordance with budgets and programs of work submitted by the State directors of extension and approved by the Secretary of Agriculture. Expenditures by the States from this and other cooperative extension appropriations are subject to annual inspection by representatives of the Department.

EMERGENCY FUNDS
(Complete bureau statement)

Direct Allotments

Projects	Obligated, 1936	Estimated obligations, 1937	Estimated obligations, 1938
Agricultural Adjustment Administration (transferred to Extension Service):			
Salaries and Expenses:			
Technical assistance to Extension Service (Washington office) on agricultural adjustment programs	$8,400	$11,640	$11,640
For participation in the Sixth World's Poultry Congress	----	10,000	----
Advances to A.A.A.:			
Technical advice and assistance to State extension forces on agricultural adjustment programs	3,362,852	----	----
Administration of Cotton Act of 1934:			
For special assistance to State extension forces in the administration of the Cotton Act of 1934	2,251,306	----	----
Advances under Tobacco Act:			
For special assistance to State extension services in the administration of the Kerr-Smith Tobacco Act	137,000	----	----
General Expenses:			
For special assistance to State extension forces on cattle purchase program	23,000	----	----
Payments for Agricultural Adjustment:			
For assistance to State extension forces in completion of commodity programs, including back obligations	1,122,475	177,525	----
Exportation and Domestic Consumption of Agricultural Commodities (Cotton Price Adjustment):			
For special assistance to State extension forces in administering the cotton-price adjustment plan	1,585,000	448,444	----
Payments for Agricultural Adjustment (Payments under Tobacco, Cotton and Potato Acts):			
For payment of obligations incurred by State extension forces in administration of the Bankhead cotton program	650,000	----	----
Total, A.A.A. Funds	9,140,033	647,609	11,640

EMERGENCY FUNDS -- Continued.
(Complete bureau statement --Continued)

Direct Allotments -- Continued.

Projects	Obligated, 1936	Estimated obligations, 1937	Estimated obligations, 1938
Conservation and Use of Agricultural Land Resources, Department of Agriculture:			
For special assistance to State extension forces on projects incident to the agricultural conservation program.	$75,000	$879,704	$554,000
Emergency Relief Appropriation Act of 1935:			
For renovating and rebuilding agricultural exhibits.....	4,059	----	----
Wind Erosion Control in Southern Great Plains Area: Allotment authorized by Sec. 4 of Soil Conservation and Domestic Allotment Act of Feb. 29, 1936 (for apportionment to States for wind erosion control).....	1,950,000	50,000	----
Total, Emergency Relief Appropriation Act of 1935.....	1,954,059	50,000	----
Total, Emergency Funds (Direct Allotments)...	11,169,092	1,577,313	565,640

WEATHER BUREAU

(a) GENERAL ADMINISTRATIVE EXPENSES

Appropriation Act, 1937	$138,280
Budget Estimate, 1938	170,000
Increase	31,720

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)	Increase
1. General administration and business service...	$138,067	$138,280	$170,000	+$31,720 (1)
Unobligated balance	213	- - -	- - -	- - -
Total appropriation	138,280	138,280	170,000	+ 31,720 (1)

INCREASES

(1) The increase of $31,720 in this item for 1938 consists of:

(a) $25,000 for the purchase of an off-set lithographic press and equipment therefor. The existing manner of issuing the daily weather map at Washington, D. C., by the antiquated lithographic stone transfer method is slow and cumbersome, and the present press equipment, which can not be renewed because of obsolete manufacture, is worn out in service after thirty years of constant and heavy use. The procurement of an off-set lithographic press, with camera and other equipment, at a cost of $25,000, is an essential requirement that can not longer be safely postponed. This expenditure will be non-recurring and need be appropriated for 1938 only.

(b) $6,720 to meet the bare necessities of administrative maintenance in Washington, D. C., including the employment of a photolithographer at $2,300 and small increases for power, alterations, and miscellaneous equipment and services.

CHANGES IN LANGUAGE

The language of this paragraph has been amended by the inclusion of a limitation for the purchase of an off-set lithographic press. As amended the item will read:

> General administrative expenses: For necessary expenses for general administrative purposes, including the salary of chief of bureau and other personal services in the District of Columbia, [$138,280] and not to exceed $25,000 for the purchase of an off-set lithographic press and equipment therefor, $170,000.

WORK UNDER THIS APPROPRIATION

General Administration and Business Service.--General administration of the Bureau is centralized in Washington, D. C., and this appropriation is for the maintenance of fiscal and administrative units, including offices concerned with matters of personnel, accounting, contracts, files, and property.

(b) GENERAL WEATHER SERVICE AND RESEARCH

Appropriation Act, 1937.....	$2,228,655
First Deficiency Act, 1936 (available in 1937 for reestablishment of Weather Bureau station at Lynchburg, Va.).....	+12,000
Total available, 1937.....	2,240,655
Budget Estimate, 1938.....	2,307,935
Increase.....	67,280

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)	Increase
1. Meteorological service:				
a. General forecast and warning service	$853,158	$931,200	$968,485	+$37,285 (1)
b. Climatological service...	621,992	636,400	646,400	+ 10,000 (2)
c. Hurricane and storm-warning service.....	95,837	98,900	110,195	+ 11,295 (3)
d. River and flood service..	147,445	160,200	168,900	+ 8,700 (4)
e. Forest fire weather service.....	37,515	74,900	74,900	- -
f. Agricultural meteorological service.....	110,941	113,900	113,900	- -
g. Marine meteorological service.....	100,001	105,300	105,300	- -
h. Horticultural protection service.....	38,283	39,467	39,467	- -
Total, Meteorological service.....	2,005,172	2,160,267	2,227,547	+ 67,280

PROJECT STATEMENT - (Continued)

Projects	1936	1937 (Estimated)	1938 (Estimated)	Increase
2. Meteorological reseach:				
a. Meteorological physics...	10,973	10,700	10,700	- -
b. Forecast improvement investigations.....	22,587	24,420	24,420	- -
c. Hurricane investigations.	5,991	6,300	6,300	- -
d. River and flood investigations.....	6,031	4,900	4,900	- -
e. Forest fire weather investigations.....	4,453	3,800	3,800	- -
f. Agricultural meteorological investigations..	3,722	3,600	3,600	- -
g. Climatological investigations.....	5,167	5,100	5,100	- -
h. Marine meteorological investigations.....	12,333	11,568	11,568	- -
i. Horticultural protection investigations.....	10,751	10,000	10,000	- -
Total, Meteorological research.....	82,008	80,388	80,388	- -
Unobligated balance.....	9,955	- -	- -	- -
Total appropriation.....	2,097,135	2,240,655	2,307,935	+67,280

INCREASES

The increase of $67,280 in this item for 1938 consists of:

(1) $37,285 for rehabilitating the forecast and warning service at several Weather Bureau stations which have been closed down, and for general strengthening of this work. The meteorological first-order station at Concord, N. H., was closed in 1933 on account of a reduction in the appropriation. Its reopening is urgently necessary, there being at present no other first-order station in New Hampshire to serve the needs of that State. Rehabilitation and restoration of service is needed at many other stations, but only a few of the most pressing needs are being proposed here. One of these is the repair and strengthening of the Weather Bureau observatory building at North Head, Wash., which has become a hazard due to age and its coastal location where it is exposed to heavy gales, sometimes of hurricane force.

There is a real need for connecting the Weather Bureau offices located in large commercial cities with the Air Commerce teletype system in order to make valuable hourly weather data available to the business interests of those cities. Under this increase only four installations are proposed in cities where the greatest necessity exists.

The extensive communication service of the Bureau used in the collection and distribution of weather observations is handled by means of a word code. This code is now obsolete. Meteorological message transmission by practically all other national weather services is by an international figure code. Efficient cooperation in the exchange of essential data with other countries, particularly Canada, is impracticable under these conditions. The use of the figure code by the United States will permit the receipt and distribution of additional valuable data and avoid the loss of time required in the frequent necessity for transposing messages from one code to the other. The greater cost is due to the increased rate asked by the commercial telegraph company for handling the figure code. For this purpose an increase of $20,285 is recommended under this subappropriation and $35,000 under the subappropriation "Aerology".

(2) $10,000 for the rehabilitation and improvement of the climatological service. The service conducted under this project involves the maintenance of about 5,000 substations located throughout the United States and constitutes a cooperative organization between the Bureau and public-spirited citizens who, without monetary compensation, take and record observations by means of instruments supplied by the Bureau. There is very great need for many additional stations to properly record the climate of the United States. Moreover, the large economy of this cooperation is jeopardized by inability of the Bureau to equip the stations properly and provide for necessary expansion with the growth of the country; nor has it been possible to employ an adequate inspectional staff of technical men. The efficient and successful maintenance of a service having so many unpaid observers is largely dependent upon frequent personal contact, direction, and encouragement. The rehabilitation and maintenance of this valuable cooperative service on a high plane, including the furnishing of more adequate equipment, is a fundamental need and economically justified. A small but important beginning toward accomplishing this purpose can be made with the increase recommended by extending the inspectional work and by replacing defective or inadequate equipment.

(3) $11,295 to strengthen the hurricane and storm-warning service. This project, which includes the operation of a teletype system connecting twelve Weather Bureau offices along the Atlantic and Gulf coasts from Jacksonville to Brownsville, requires additional personnel and the securing of more observations from ships at sea. During the hurricane season, June 15 to November 15, inclusive, forecasters and observers carry out a continuous program of duty 24 hours each day, Sundays and holidays included, at all of the stations having teletype connections. At these stations much general service is rendered to the public in addition to that relating to hurricanes. At some of them only three employees are assigned and at some others four. This is insufficient for daily 24-hour duty. It does not admit of hours of service being confined to legal limitations nor provide for relief; consequently personal hardship is imposed. It is the purpose to assign an additional employee to four of the stations where assistance is most needed. A part of the increase would be expended for radio transmission of weather observations from ships located in ocean areas traversed by hurricanes. Such additional reports will greatly facilitate the locating of tropical storms and in determining their intensity and direction of progress.

(4) $8,700 for a much-needed expansion of the river and flood service. The well-justified confidence of the public in the accuracy of the Bureau's river-stage forecasts imposes a heavy responsibility to see that the lives and property of those endangered by threatened floods are safeguarded to the utmost. After every important flood widespread and insistent appeal is made for extension of the flood warnings to valleys having only a skeleton service, or none at all, and for a lengthening of the time covered by forecasts. Progress, although slow, is being made. Weather Bureau offices now have a great number of interests to look after and, since river-stage and flood forecasting is a very specialized branch of hydrology, the men have not had the time to keep abreast of the advances in knowledge at present available. The first step in correcting this condition is to effect a reorganization and specialization of the work under eight divisions, each division to be in charge of a hydrologic supervisor and assistant. Two of these divisions were established during the current year, and this increase will provide for an additional division in 1938 covering the North Atlantic Seaboard region, including James Basin and all country to the northward.

CHANGE IN AMOUNT OF CONTRIBUTION TO INTERNATIONAL METEOROLOGICAL COMMITTEE

The limitation on the amount ($800) which may be expended from this appropriation as the contribution of the United States to the cost of the office of the secretariat of the International Meteorological Committee has been raised to $1,500. When this provision was inserted in the Agricultural Appropriation Act for the fiscal year 1931, $800 had an exchange value of approximately 4,000 gold francs, which was decided upon at the time as the proper contribution from each of the larger countries represented on the Committee. With the change in the currency rate which has prevailed during the past two years, the $800 contribution now made is an actual equivalent of only about 2,450 gold francs, or less than two-thirds as much as the other large countries, such as Great Britain, France, Germany, etc., are paying. An increase to $1,500 in the contribution of the United States would bring the total to an equivalent of 4,000 gold francs. This will not involve any increase in the total appropriation for "General Weather Service and Research".

WORK UNDER THIS APPROPRIATION

General.--This appropriation provides for the conduct of most of the major service activities of the Weather Bureau necessary for the maintenance of nationwide meteorological activities serving agriculture, commerce, and many other special interests, as well as the general public. The work consists of the collection and dissemination of meteorological data and the issuance and distribution of weather forecasts, warnings, and advices, as well as the basic research essential thereto. The advisory and warning services, including those in connection with occurrence of storms, hurricanes, cold waves, frosts, fire-weather conditions, and floods, are fundamental purposes set forth in the organic act creating the Weather Bureau.

1. Meteorological Service.

(a) General Forecast and Warning Service.--The preparation and dissemination of weather forecasts and warnings constitute a fundamental activity of the Bureau, and for this purpose Congress originally authorized a Federal

weather service in 1870. Under this project the Bureau is required to take, record, encipher, telegraph, and compile regular meteorological observations; to issue general and local weather forecasts daily, including frost, cold-wave, and other special warnings and forecasts when injurious weather and temperature conditions are expected; and to disseminate weather forecasts, warnings, and synopses by telephone and telegraph, by printed bulletins, maps, and forecast cards, and through cooperation with the newspapers, radio broadcasting stations, and other available means, for the benefit of agriculture, commerce, and navigation in all parts of the United States and in adjacent ocean areas. Synoptic weather observations are collected by telegraph and entered on skeleton maps. The forecasters, from experience in dealing with many weather maps and a knowledge of the physical processes involved, are able to predict with accuracy the weather changes that will ensue. The forecasts and warnings so prepared are promptly and widely disseminated.

(b) Climatological service.--This service was established by an Act of Congress (U.S.C., title 15, secs. 311-313, 317), effective July 1, 1891, which charged the Weather Bureau with collecting meteorological data sufficient to establish the climatological characteristics of the United States. The work covers the collection and publication of climatological data for all parts of the United States, including the preparation of maps to show normal climatic conditions in different sections of the country. It involves the maintenance of 4,500 cooperative and other meteorological stations, for which daily, monthly, and annual reports of temperature, precipitation, etc., are compiled and published. There are published 42 separate monthly and annual reports, and data for the entire country are published annually in the Report of the Chief of the Weather Bureau. Summarizations are issued in Bulletin W for all past years of record.

(c) Hurricane and Storm-Warning Service.--Issuance of storm warnings for the Great Lakes was authorized by Congress in 1870. The service has since been extended to the Atlantic, Pacific, and Gulf coasts, and use of radio on shipboard has resulted in extension of the service to ships at sea. The Bureau must locate and follow storms, including those of tropical origin (hurricanes) by means of synoptic observations assembled on weather charts; furnish information as to the location, intensity, and probable movement of storms; and issue warnings of their approach (including prediction of dangerous winds and tides which sometimes attend them) for the benefit of mariners and residents of seacoast and lakeshore sections. Observations are collected by radio and cable from West Indian stations and from ships at sea to supplement the regular collection for general forecast purposes. Advices and warnings are disseminated by telegraph, telephone, and radio from district forecast centers. Warnings are displayed by means of flags and lanterns at 259 local display stations, which are maintained under the supervision of 53 storm-warning centers.

(d) River and Flood Service.--Service was organized in 1870 by the installation of a few river and rain gages. The growth of the service has been gradual, and the organization now consists of approximately 700 river-gage stations, 300 rainfall, 84 snowfall, and about 50 evaporation stations. The country is divided, for the purposes of administration and forecasting, into 71 districts, each having a central office, the whole being under the

administrative control of the River and Flood Division. The river stages read daily are published annually in one volume. The primary object of the service is the making of river-stage and flood forecasts for the protection of human lives and for the benefit of agriculture, navigation, engineering interests, and all users of river water. The flood forecasts are of general use and benefit throughout the river valleys and are the means of saving annually millions of dollars worth of property. The river-stage forecasts made from day to day are of vital importance to navigation interests and construction work in progress along rivers. Snowfall measurements in mountains are made for determining the effect of melting snows on streams. Evaporation measurements are made to determine water losses, particularly in semi-arid regions. The stage publication is used principally by agriculturists, engineers, and navigators. River-stage, rain, snowfall, and evaporation observations are collected in the district offices, where they are charted, and whence the necessary forecasts and warnings and other reports are issued. The stage publication is prepared and printed in Washington.

(e) Forest Fire Weather Service.--Fire-weather warnings were first issued in 1916 as a regular service from district forecast centers. In succeeding years several independent fire-weather districts were organized with specialists assigned to the work. Seven separate districts are now maintained. In the conduct of this work meteorological data from fire-weather substations in forested areas are collected and compiled to ascertain the influence of current weather conditions on the frequency and spread of fires. Daily observations obtained by telegraph, telephone, and radio from these substations are utilized in the preparation of special forecasts and warnings, which are issued to Federal, State, and private agencies engaged in the protection of forests from fires. Acting upon the forecasts and warnings, forestry officials augment, deploy, or concentrate their fire-fighting forces in accordance with the indicated weather and hazard conditions. In western districts additional service is offered in the form of fire-weather trucks, which, equipped with radio transmitters and receivers and meteorological and office equipment, are dispatched on call to the site of large going forest fires. Here the portable meteorological units become an integral part of the fire-fighting organization. Being complete self-contained communications and forecasting offices, detailed weather information and fire-weather reports are received by radio, and the officials in charge of fire fighting are kept constantly informed as to weather conditions which might affect the spread or control of the fires.

(f) Agricultural Meteorological Service.--In 1872 the Signal Service of the War Department published the first weather bulletin in this country, containing a summary of weather as affecting agriculture. This was finally developed into what are now known as "Corn and Wheat and Cotton Region Bulletins" and "Weekly Weather and Crop Bulletins", which are published at Washington and certain field stations. This project provides for the collection and publication of data relating to current weather conditions and their effect on crop growth and agricultural operations in general. Publication of the data and determination of their effect on crop growth and farm work are based largely on reports from numerous weather observers and weather and crop correspondents in all sections of the United States and on known relations of weather to crops established during investigations of the relationship to crop yields.

(g) Marine Meteorological Service.--Service work on ocean meteorology has been conducted by the Government for almost a century. The Navy and (successively) the Army and the Weather Bureau have maintained individually or cooperatively the continuity of this activity since 1844. The Weather Bureau is now specifically designated by law (U.S.C., title 5, Sec.458a) to conduct the major lines of work in ocean meteorology and to furnish meteorological information published on the Pilot Charts issued by the Hydrographic Office of the Navy. The primary objects of the project are the maintenance and improvement of ocean weather observations and reports through an extensive program organized for rapidly collecting, charting, and summarizing the reports to provide maritime commerce with accurate, properly digested meteorological information and at the same time to secure data for basic studies of weather conditions and storms affecting the continental United States and the adjacent oceans. Daily weather observations at sea are taken and reported in prescribed form by ships' officers using (in the main) meteorological instruments that are regularly a part of a ship's instrumental equipment. Contacts with the observing officers and supervision of the meteorological instruments are largely accomplished through 30 field offices of the Weather Bureau located at major ports of the United States and its island possessions.

(h) Horticultural Protection Service.--With the advent of systematic practice of protecting orchards and truck gardens from frost, specialized local forecasts, as an aid in protecting operations, became necessary. The special Horticultural Protection Service of the Weather Bureau began in 1917. The work consists of specialized local forecasts for the use of fruit and truck growers in their frost-protection work; also advice as to best methods of protection. The forecasts are made from synoptic weather charts and current local observations, including hydrometric formulae applicable to the particular locality.

2. Meteorological Research.

(a) Meteorological Physics.--A knowledge of the physical processes that occur in the atmosphere is basic to an efficient meteorological service. Studies along this line have been made in the past with important results, but they are even more necessary and valuable now in view of the more abundant and more accurate data available on land, at sea, and in the air and the increasing use of the knowledge of physical processes in all practical applications of meteorology. The object of the work is to gain a wider and more accurate knowledge of the structure of the atmosphere and a fuller understanding of all that occurs in it, including solar radiation, its amount and properties, and its action within the atmosphere. One or more technical problems are kept under specific study and investigation at all times. The current literature on technical subjects relating to meteorology is read and digested in order to keep fully informed of every new development that contributes to our knowledge of the subject. Continual contact is maintained with others conducting scientific research in similar fields of endeavor.

(b) Forecast Improvement Investigations.--Studies for the purpose of improving the accuracy and extending the period of weather forecasts have been carried on currently since the establishment of the Weather Bureau. Such studies have resulted in many betterments of service. The work covers investigations of the causes of weather changes, in order that the physical

basis of the changes may be better understood; the formulation of rules and principles for the guidance of the forecaster; and the development of means for making forecasts of a reliable character for periods of a month or more in advance, for the benefit of agricultural and other interests. Investigations are carried on as a regular program at six district forecast centers where the forecasters alternate monthly between active duty and study. Similar researches are conducted at other field stations. Intensive studies of this character, including air-mass analysis methods, are prosecuted at the central office in Washington. Files of daily weather maps and the meteorological records, both surface and upper-air, of past months, seasons, and years form the basis of statistical and other special studies.

(c) Hurricane Investigations.--Investigations of hurricanes by the Weather Bureau date back nearly half a century. Development and utilization of the knowledge of hurricane characteristics and movements was stimulated by the invention and growth of radio communication in the first quarter of the present century. As a result, much additional information is now available as a basis for the investigations. Fully developed hurricanes are attended by winds dangerous to ships at sea and destructive to life and property in coastal sections. Some are accompanied by inundations which cause great loss of life and property. A better understanding of the causes of hurricane genesis and movement is needed in the issue of warnings of greater detail and accuracy. Earlier warnings are needed for taking precautions to save lives of persons in exposed places and to protect property in the threatened areas. All available observations from ships at sea and island and coastal stations, including detailed reports secured by mail, are charted for study of each hurricane. The studies concern the movement of hurricanes in relation to kind, amount, and movement of clouds; wind directions and speed at the surface and from pilot balloon observations of the upper air; direction, period, and amplitude of sea swells which precede the hurricane; tides along the coast in advance of the storm center; and the general pressure distribution.

(d) River and Flood Investigations.--This work consists of investigations of the relation of precipitation to both ordinary flow and flood flow in streams; and losses by evaporation from water that is to be used consumptively, industrially, or for navigation. The present empirical methods of estimating stream flow and water losses are unsatisfactory and should be replaced by formulae evolved from improved data now becoming available through the use of recording gages. It is proposed to construct volumetric or discharge formulae for forecasting river stages and floods, to study the effect on stream flow of accumulated snow in mountains, and to determine as nearly as possible the water losses by evaporation.

(e) Forest Fire Weather Investigations.--Forest fires cause great economic losses. In some years losses run into hundreds of millions of dollars. One of the functions of the Weather Bureau is to determine the exact relationships between meteorological conditions and the inception and spread of forest fires. Intensive investigations of this character were instituted in 1924. The studies conducted under this project result in a more adequate conception of the effects of weather conditions upon fire hazard and the variations of temperature, humidity, etc., over areas of varied topography. Such information is essential, and results of statistical and other studies are used to improve the fire weather warning service. Daily

observations are compiled by decades, months, and seasons, and the extremes and averages of conditions are correlated with fire occurrences. Intensive studies of weather conditions in relation to the occurrence of lightning storms with little or no precipitation are carried on because of the large number of fires caused thereby.

(f) Agricultural Meteorological Investigations.--For many years there have been more or less systematically conducted investigations of the effect of weather on crops. Results of the first extensive investigations of the Weather Bureau in this field are contained in Weather Bureau Bulletin No. 36, "Relations Between Climates and Crops", by Cleveland Abbe, in 1905. Since then considerable investigational work has been done and the results published. Investigations are made to determine the relation between weather and crops, especially optimum weather conditions for different crops, as an aid, among other things, in determining the areas best suited, from the climatic standpoint, for various crops. Up to the present time the work has been carried on principally through mathematical correlations of temperature, sunshine, precipitation, relative humidity, and other weather phases to crop yields.

(g) Climatological Investigations.--When sufficient meteorological records became available, for some stations as early as 1870, investigations were begun to determine the climatic characteristics of different sections of the United States, and work of this character has continued up to the present time, becoming more dependable as the length of the records increased. Also from time to time various climatic charts have been prepared and revised as additional data became available. Studies are made to determine the climatic features of the United States and, incidentally, in a meager way, of foreign countries. Climate is a determining factor in economic land use, and for best results in agriculture, in general, and for specific use of land for certain crops, it is necessary to have dependable information as to the normal climate. Summarizing, studying, charting, and comparing weather records of different sections for long periods of time and the preparation of normal charts for different climatic elements showing geographic distribution of comparable conditions are conducted under this project; also special studies, such as climatic trends, for different areas.

(h) Marine Meteorological Investigations.--The study of winds and storms at sea constituted one of the earliest phases of meteorological research because of the extreme importance of ocean weather to transport by sail, and this interest on the part of navigators has continued to the present time. The development of air navigation over the sea now calls for extensive surveys of data from a new point of view. Present-day needs also require research into atmospheric conditions over the oceans, inasmuch as it is now understood that the major energy supplies of the atmosphere are largely derived from the ocean surface. Research in marine meteorology, therefore, has the following objectives: (1) Continual revision and improvement of the data required by law to be furnished for publications on the Pilot Charts of the Hydrographic Office of the Navy Department for benefit of maritime commerce; (2) extraction of data from the accumulated records for application to modern problems of ocean transport, including air navigation, air-conditioning and refrigerating of ships, and determination of climatic influences on cargoes moving on routes that encounter a wide variety of weather conditions within the term of a single passage; and (3) investigation into the energy relations subsisting between the ocean surface and the over-

lying atmosphere, to secure data useful for studies of air-mass analyses and for possible application to problems of extension in the range of weather forecasts. Research is being advanced by the development of punch-card methods of statistical analysis; by application of mathematical correlation methods to evaluate the importance of diverse factors of relation between ocean and atmosphere; and by steady increase in properly digested summaries of ocean weather data.

(i) Horticultural Protection Investigations.--For specialized local frost forecasting for the protection of fruit and vegetables, basic data applicable to the specific localities were necessary, and investigational work to obtain these began in 1917. Various forecasting formulae, etc., have been improved from time to time as longer records became available. Studies are made to determine the relative susceptibility to frost of different localities having varying topographic features, and meteorological data are collected for the preparation of hygrometric formulae as an aid in local forecasting. Investigations are also conducted as to the most effective and economical methods of protecting fruit and vegetable crops from frost damage. Establishment and maintenance of a number of meteorological stations representing different topographic and other conditions is required to determine temperature and humidity relations in different localities.

(c) AEROLOGY

Appropriation Act, 1937.....	$1,494,089
Budget Estimate, 1938.....	1,782,950
Increase.....	288,861 (a)

(a) Including apparent increase of $140,000 transferred from "Air Navigation Facilities", Department of Commerce, and permanently transferred to the Weather Bureau, with corresponding reduction in the Department of Commerce appropriation, for airways communications costs. In 1936, $93,370, and in 1937, $140,000, were made available from Department of Commerce funds for this work, as shown in the following Project Statement.

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)	Increase or decrease
1. Aerological service:				
a. Commercial airway meteorological service	$972,032	$1,266,760	$1,357,850	+$91,090(1)
b. Upper-air soundings	283,777	330,900	388,671	+ 57,771(2)
Total, Aerological service	1,255,809	1,597,660	1,746,521	+148,861
2. Aerological research:				
a. Commercial airway forecast investigations	7,651	8,200	8,200	- -
b. Upper-air surveys and investigations	27,253	28,229	28,229	- -
Total, Aerological research	34,904	36,429	36,429	- -
Total obligations	1,290,713	1,634,089	1,782,950	+148,861
Received by transfer from "Air Navigation Facilities", Department of Commerce	- 76,339	- 140,000	- -	+140,000(3)
Unobligated balance of funds transferred in 1935	- 17,031	- -	- -	- -
Unobligated balance	6,446	- -	- -	- -
Total appropriation	1,203,789	1,494,089	1,782,950	+288,861

INCREASES

The increase of $288,861 in this item for 1938 consists of an apparent increase, by transfer of $140,000 for airways communication costs, and now appropriated to the Department of Commerce, which has been reduced accordingly, and an actual increase of $148,861, as follows:

(1) An increase of $91,090 for extending and improving the commercial airway meteorological service, as follows:

(a) $35,000 for cost of installing an international figure code in the transmission of weather messages in place of the present word code. The justification for this change has been given under the item "General Weather Service and Research".

(b) $56,090 for the replacement of part-time personnel by qualified Civil Service appointees. At present, intermediate hourly weather-reporting teletype stations of the Weather Bureau are manned by airway observers employed from among local citizens with an average pay of from $1.50 to $3.00 a day. Such persons rarely have even an elementary knowledge of meteorology and the low pay is not

sufficient to attract suitable individuals. High-speed air transport and blind-flying operations as at present developed and practiced require accurate and reliable weather observations for safety of the lives of passengers and pilots. The observations have become more and more technical as the needs for accurate meteorological information have increased until now observers are required to read mercurial barometers; make mathematical computations reducing such readings to sea level or 5,000-foot planes; compute and code pressure changes; determine types, direction, quantity, and height of various cloud layers; identify fronts as they pass the station; operate the teletype in symbol code at 176 characters a minute, etc. When it is realized that this work is required of untrained personnel and that the results must be relied upon by transport operators, pilots, Weather Bureau forecasters, and passengers on the airways, it will be seen that the Weather Bureau would expose itself to the charge of gross negligence if it failed to call attention to the need for correcting this situation. Furthermore, observers under their present terms of employment serve only on a part-time basis, which means that corrective action is difficult to take and maintain in the event that special observations between the regular observations are not taken by the observers. These special observations are highly important to pilots and others depending upon advice as to changes in weather conditions which may involve the safety of their own and their passengers' lives. In other words, the present system does not meet the existing needs and can be corrected only by replacing airway observers by commissioned personnel under the direct and rigid control of the Weather Bureau. The additional funds requested will not allow complete substitution of all part-time personnel but will permit partial correction at many important points.

(2) An increase of $57,771 to extend and improve observations in the upper air. The War Department now furnishes airplanes and pilots for the taking of airplane observations at eight important and strategically located points over the country. This is a diversion which the War Department is unable to continue from the normal use of equipment and personnel needed for other purposes, and the officials of that Department have requested that the Weather Bureau take over this work at Boston, Mass.; Mitchel Field, N.Y.; Selfridge Field, Mich.; Scott Field, Ill., and Barksdale Field, La., beginning July 1, 1937. The War Department will continue flights at Maxwell Field, Ala.; Kelly Field, Tex., and Wright Field, Ohio. It is absolutely necessary that flights at the five points mentioned be continued for the reason that continued developments in long-distance, high-speed air transportation require the issuance of more and more accurate and definite forecasts for the benefit of such flights, and this can not be accomplished unless adequate information is available. Such information must include data concerning fronts, types of air masses, depth of air masses, height of tops of cloud layers, icing conditions, etc., all of which can be obtained only through the making of airplane observations. The safety of air traffic, therefore, largely depends upon the availability of such data, which, in turn, can be obtained and utilized for such purposes by this bureau only if funds are provided to carry out an adequate program. These flights are also of inestimable value in general weather forecasting and for use by agricultural, industrial, building, commercial, and other interests. By modern meteorological methods the data secured by means of airplane observations can be utilized to improve the accuracy of all forecasts, but the distribution of stations should be adequate to secure a fair cross-section of the entire country.

(3) An apparent increase of $140,000 for airways communication service but not an actual increase of appropriation, since this merely represents a transfer of funds from the Department of Commerce, whose appropriations have been reduced in the same amount. A similar amount ($140,000) is available to the Weather Bureau for this work during the fiscal year 1937 from Department of Commerce funds. Recommendations for the outright transfer of this money was initiated by the Secretary of Commerce. It will eliminate the necessity existing heretofore of effecting annual transfers of funds, by Treasury warrants, from the Department of Commerce (receiving the appropriation) to the Department of Agriculture (making the direct expenditure).

WORK UNDER THIS APPROPRIATION

General.--As a consequence of the provisions of the Air Commerce Act of 1926, meteorological information and flying-weather forecasts are furnished to pilots on all airways designated by the Secretary of Commerce as routes suitable for air commerce. In addition, investigation and study and general weather forecasting of the upper air in the interest of air navigation are conducted under this appropriation.

1. Aerological Service.

(a) Commercial Airway Meteorological Service.--Intensive weather service for air navigation was inaugurated by the Weather Bureau soon after passage of the Air Commerce Act in May, 1926. At the close of 1926 the transcontinental airway was the only one on which flights were being made both day and night. Since that time the airway weather service has expanded with increased number of Federal airways. In 1936 there were approximately 14,000 miles of airways over which 24-hour weather service was maintained and approximately 18,000 miles over which service was maintained on a less than 24-hour basis. The airway weather service is maintained to provide the maximum amount of safety possible in air navigation so far as weather is concerned.

Specific and accurate weather information is essential in air travel, particularly as regards ceiling heights and visibility. The airway weather service consists primarily of hourly reports from stations on the airways and 6-hourly reports from off-airway stations, the latter category of which is being expanded by the addition of over 100 stations during the current fiscal year, thus providing a much more dense network of reports over the country as a whole than has been available heretofore. These reports are collected at 10 designated centers where they are charted and aviation forecasts and summaries prepared. These forecasts and summaries are promptly distributed over the airways network, chiefly by means of teletype and radio, with special advices at 3-hourly intervals whenever important weather changes justify.

(b) Upper-Air Soundings.--Observations in the upper air were begun in 1898 by the use of kites and captive balloons. Airplane observations began to displace kites and captive balloons in 1931 and wholly supplanted them in 1933. In July 1934 the Weather Bureau operated 6 airplane observation stations by contracting with commercial flyers, and the War and Navy Departments made airplane observations at approximately an equal number of stations each. Beginning in the first half of the fiscal year 1937, the Weather Bureau will

have under contract 13 airplane observation stations, including one at Fairbanks, Alaska; the War and Navy Departments will make observations at 8 and 7 stations, respectively, one of the Navy Department's stations being at Pearl Harbor, Hawaii; the Dominion of Canada will make airplane observations at Fort Smith and Toronto, Canada; and the Government of Newfoundland will make such observations at Norris Arm, Newfoundland; all of which will be available for use at forecast centers and other points in the United States. Pilot-balloon observations were inaugurated by the Weather Bureau in 1918, with the number of stations gradually increasing to some 70 in 1935. Airplane and pilot balloon observations are essential in both general and airway forecasting and in identifying air masses. Sounding-balloon observations provide the same data as both airplane and pilot balloon observations but to much greater heights. The records, however, are not available for current use, as the meteorograph usually lands at a considerable distance from the stations. Airplane observations are made daily to heights of 16,500 feet, and free-air temperatures, pressures, and humidities are obtained. Pilot-balloon observations are made from 2 to 4 times daily, and free-air wind directions and velocities at various elevations are obtained. These data are furnished to local flying interests and promptly transmitted to the various forecast centers. The computed records are forwarded to the central office of the Weather Bureau at Washington, where they are summarized and used in special studies and investigations. Monthly free-air temperatures and relative humidities for each station and monthly free-air wind resultants for a selected number of key stations are published regularly in the "Monthly Weather Review". Sounding-balloon observations are made at only one or a relatively few stations in connection with special investigations of particular weather conditions and during international programs.

2. Aerological Research.

(a) Commercial Airway Forecast Investigations.--With the accumulation of observational data obtained since the inauguration of intensive airway weather service subsequent to the passage of the Air Commerce Act of 1926, studies have been made with a particular view to determining average flying weather conditions along the airways. Such studies are valuable in laying out new airports and airways and for determining regular flight schedules. Investigations under this project are conducted at the central office at Washington, D. C., and at stations where qualified personnel and the necessary data are available.

(b) Upper-Air Surveys and Investigations.--Numerous aerological surveys have been made to determine average temperatures, pressures, humidities, densities, winds, etc., at various elevations for different sections of the country, as well as special studies and investigations of upper-air conditions. Upper-air observations are classified and correlated with surface conditions in order to determine significant relationships which may be useful in forecasting or to aid in a better understanding of the mechanics of the atmosphere. All observational data are forwarded to the central office of the Weather Bureau in Washington where they are summarized and classified. The data are then used for making special studies and investigations leading to the improvement of general and airway forecasting, both as regards accuracy and length of time covered; to determine meteorological conditions favorable for the formation of ice on aircraft; and to effect improvements in methods of pressure reductions to sea level and to the 5000-foot plane; and to increase our knowlege of the mechanics of the atmosphere.

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CHANGE IN LANGUAGE UNDER PARAGRAPH "TOTAL, WEATHER BUREAU"

The "bureau total" paragraph has been amended by the addition of the following language:

> "Provided, That Weather Bureau part-time employees, appointed by designation or otherwise, under regulations of the Civil Service Commission, for observational work, may perform odd jobs in the installation, repair, improvement, alteration, cleaning, or removal of Government property and receive compensation therefor at rates of pay to be fixed by the Secretary of Agriculture."

The Weather Bureau employs, by designation or appointment under regulations of the Civil Service Commission, several thousand low-paid, part-time observers--at rates ranging from 25 cents per observation to $100 per month, but mostly from $7 to $10 per month--located in all parts of the United States, most of them outside of cities and many at isolated points far from sources where labor may readily be secured for installing, repairing, painting, altering, or taking down the Bureau's instrumental equipment. The need arises at these places from time to time for odd job work, such as painting an instrument shelter or cleaning a river gage, which can easily be done by the observer in his own time, if permitted, without calling upon outside assistance that often, of necessity, can only be procured at much higher cost for the job than if performed and charged for by our observer at the site who is familiar with what is to be done. Payment for such odd jobs can not now be made to the observers, however, because such work is regarded by the Comptroller General as dual employment under Sec. 1764, Revised Statutes (U.S.C., title 5, sec. 69). If this special authority were granted, it would result in a greater efficiency in the prosecution of project work and economy in the expenditure of public funds.

EMERGENCY FUNDS

Direct Allotments

Projects	Obligated, 1936	Estimated obligations, 1937
Emergency Relief Appropriation Act of 1935:		
Development of a method of long-range weather forecasting	$12,164	$2,060
Repair or replacement of river gages damaged or destroyed by the floods of 1936	- -	5,000
Total, Emergency Relief (1935)	12,164	7,060
Public Works Allotments (National Industrial Recovery Act):		
Physical improvements (completion of work begun in 1934):		
General forecast and warning service	140	- -
Climatological service	112	- -
Total, Public Works Allotments	252	- -
Total Emergency Funds (Direct Allotments)	12,416	7,060

BUREAU OF ANIMAL INDUSTRY

(a) SALARIES AND EXPENSES - PREAMBLE

CHANGES IN LANGUAGE

The preamble or introductory paragraph covering this appropriation has in the past listed in a uniform manner the acts which were being administered by funds provided thereunder.

Prior to the fiscal year 1936, the funds for administering the Meat Inspection Act of June 30, 1906 (U.S.C., title 21, sec. 95), as amended by the Act of March 4, 1907 (U.S.C., title 21, secs. 71-94), and as extended to equine meat by the Act of July 24, 1919 (U.S.C., title 21, sec. 96), were provided from a permanent annual appropriation of $3,000,000, as well as a yearly supplemental appropriation which was carried as an independent item and not as a part of "Salaries and Expenses, Bureau of Animal Industry." Starting with the fiscal year 1936, all funds for carrying on meat-inspection work were provided as a sub-item of the appropriation "Salaries and Expenses, Bureau of Animal Industry." However, through oversight, the acts under which meat-inspection work is conducted were not added to the introductory paragraph at that time. The new language covering this matter, inserted in the 1938 estimates, is merely for the purpose of correcting this oversight.

There is also inserted the citation to the recently enacted amendment to the Packers and Stockyards Act relating to poultry.

(b) GENERAL ADMINISTRATIVE EXPENSES

Appropriation Act, 1937	$178,220
Budget Estimate, 1938	178,220

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)
1. General administration and business service	$175,816	$178,220	$178,220
Unobligated balance	2,404	- - -	- - -
Total	178,220	178,220	178,220

WORK UNDER THIS APPROPRIATION

This appropriation is used for activities concerned with the general direction of the research, service, and regulatory work of the Bureau, including the expense of the Chief of Bureau's office, accounting, personnel, library, editorial activities, etc.

(c) ANIMAL HUSBANDRY

Appropriation Act, 1937	$769,503
Budget Estimate, 1938	789,380
Increase	19,877

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)	Increase
1. Swine husbandry investigations	$93,394	$127,422	$132,622	+ $5,200 (1)
2. Sheep and goat husbandry investigations	132,688	140,186	145,386	+ 5,200 (1)
3. Horse and mule husbandry investigations	33,734	41,934	41,934	- - -
4. Beef cattle husbandry investigations	169,009	167,766	172,966	+ 5,200 (1)
5. Dual-purpose cattle husbandry investigations	53,871	51,654	51,654	- - -
6. Poultry husbandry investigations	211,346	234,680	238,957	+ 4,277 (1)
7. Certification of pedigrees of imported registered livestock	3,681	5,861	5,861	- - -
Unobligated balance	60,780	- - -	- - -	- - -
Total	758,503(a)	769,503	789,380	+19,877 (1)

(a) For 1936, includes $25,840 allotted from miscellaneous item "Experiments in Livestock Production in Southern United States", and excludes $25,000 allotted to "Dairy Investigations", Bureau of Dairy Industry (for Red Danish cattle investigations); both transferred in Estimates for 1937,

INCREASES

(1) The increase of $19,877 in this item for 1938 is to take care of the additional cost of operation and maintenance of the new laboratory buildings which have been constructed recently at Beltsville, Maryland, for the use of this Bureau, so that research studies now under way may receive the full benefit of the facilities which have been provided. This increase is divided among four projects, as follows:

Project 1, "Swine husbandry investigations"	$5,200
Project 2, "Sheep and goat husbandry investigations"	5,200
Project 4, "Beef cattle husbandry investigations"	5,200
Project 6, "Poultry husbandry investigations"	4,277
Total	$19,877

CHANGES IN LANGUAGE

Two minor changes have been made in the language of this paragraph, as follows:

(1) The year "1938" has been substituted for the words "ending June 30, 1936". (In the Estimates for 1937, the Department neglected to recommend changing the year from "1936" to "1937".)

(2) The amount carried in the poultry proviso for 1936 was $231,180. The Budget for 1937 provided for an increase of $9,000 (making the total $240,180). Congress, however, allowed an increase of only $3,500 (making the total for poultry investigations $234,680). In drafting the Bill for 1937, however, the amount of the Budget Estimate($240,180), through inadvertence, remained unchanged. Of the $19,877 increase recommended under "Animal husbandry" for 1938 to provide more effective use of facilities at the Beltsville Research Center, $4,277 would apply to poultry investigations. Accordingly, the amount in the poultry proviso for 1938 should be $238,957.

WORK UNDER THIS APPROPRIATION

General.--The animal husbandry investigations of the Bureau of Animal Industry deal with the collection and dissemination of information on livestock problems of regional and national importance having to do with the breeding, feeding, and management of domestic farm animals, including poultry. Results are measured in terms of quantity and quality of the animals and their products, such as meat, eggs, wool, mohair, and farm power. These experiments often are conducted in cooperation with other bureaus and divisions of the Department, with one or a group of State agricultural experiment stations, with farmers, and other agencies.

1. Swine Husbandry Investigations.--This work includes studies to identify and develop strains of swine and to devise methods of feeding and management that will make possible the production of pork economically and profitably; and studies on conformation and yields, proportion of meat to bone, composition, tenderness, flavor, juiciness, and other characteristics of pork and pork products as influenced by variations in production factors and in processing and preparation, including slaughtering, chilling, cutting, curing, rendering of lard, storing, canning, and cooking. Swine normally represent about 10 percent of the value of all agricultural production in this country. The results already achieved have been highly valuable, but many problems remain to be worked out and new problems are constantly arising which call for solution.

2. Sheep and Goat Husbandry Investigations.--This work deals with the factors affecting production of lamb meat, wool, goats' milk, and mohair. Studies in the breeding and development of types most suitable for production and studies in methods of management and feeding are made with sheep and goats and the results tabulated and interpreted for other workers and for the industry. The experimental animals are of known ancestry for many generations back. Data are kept on them from birth to slaughtered carcass, including such factors as productivity, rate of growth, earliness of maturity, and quality of production. Many of the new principles which have resulted from these studies in the past have been made use of by the sheep and wool and mohair industries.

3. Horse and Mule Husbandry Investigations.--This project consists of studies in the breeding, feeding, management, cost of production and maintenance, and utilization of horses and mules, including work with both light and draft breeds of horses and physiological studies in the rearing of orphan foals. Information on stallion enrollment in the various States having stallion enrollment laws is compiled and distributed. A nationwide shortage of work stock and increased interest in the breeding of horse and mule replacements created a demand for information looking toward improved breeding stock.

4. Beef Cattle Husbandry Investigations.--This work consists chiefly of research in problems affecting the breeding, feeding, and management of beef cattle and the quality of their meat. It includes studies in range livestock production, in feeding and fattening various classes of beef cattle under both farm and range conditions, beef-cattle record-of-performance studies, breeding studies to develop crossbred cattle which will be especially adaptable to certain sections of the United States having unfavorable climate, and the development of strains within the established beef breeds that will have superior germ plasm for efficiency and quality of production. Pasture management and grazing studies, mineral deficiency problems affecting range cattle production, and special vitamin and other nutritive requirements are also dealt with.

5. Dual-Purpose Cattle Husbandry Investigations.--This work consists chiefly of research in problems relating to breeding. It includes studies in the development of true breeding strains of Milking Shorthorn and Red Polled cattle for high fertility, desirable conformation, and comparatively high production of both beef and milk; studies of the performance of the offspring to determine the relative values of germ plasm of different strains; meat studies to determine the quality of the meat; and studies of the nutritive requirements of dual-purpose cattle for growth and production.

6. Poultry Husbandry Investigations.--The work under this project consists chiefly of research in breeding, feeding, hatchability, and flock management. The breeding studies are conducted for the purpose of enabling producers to develop, through selection and breeding, more efficient egg and meat producing strains to improve the quality of eggs, breeding stock, and poultry meat. Studies in poultry nutrition are carried on in order to develop efficient diets for all classes of poultry and to develop methods for the most efficient utilization of feed in order to promote the most economical production of eggs and poultry meat of superior quality. Other lines of research embrace a study of fundamental principles involved in various physiological practices associated with the production of poultry and poultry products and studies on the most

efficient methods of incubation. Cooperation is had with the States through official State agencies in putting the regulations of the National Poultry Improvement Plan into effect, designed to improve the quality of hatching eggs, baby chicks, and breeding stock produced by those participating in the plan. Over 6,000,000 farmers raise poultry, and there are several thousand commercial poultry producers. There are over 400,000,000 laying hens kept in the United States annually and the average egg production is approximately 90, whereas improved methods of feeding and proper selection could readily increase this to 150, and, by further improved methods, to an average of 170. Approximately 800,000,000 chicks are raised in the United States annually, most of them in commercial hatcheries, of which there are approximately 12,000.

7. Certification of Pedigrees of Imported Registered Livestock.--This work is regulatory in character and consists of the certification of purebred animals imported into the United States under the provisions of paragraph 1606 of the Tariff Act of 1930. It comprises an examination of the pedigrees of the animals imported and certification thereof to the Collector of Customs at the port for entry free of duty.

(d) DISEASES OF ANIMALS

Appropriation Act, 1937..... $437,775
Budget Estimate, 1938..... 437,775

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)
1. Investigations of nonparasitic diseases of livestock:			
(a) Hemorrhagic septicemia investigations	$6,971	$2,175	$2,175
(b) Equine encephalomyelitis and forage-poisoning investigations	9,381	9,565	9,565
(c) Mammitis investigations	16,765	6,525	6,525
(d) Anaplasmosis investigations	10,634	11,415	11,415
(e) Rabies investigations	3,736	3,815	3,815
(f) Anthrax investigations	5,596	6,525	6,525
(g) Swine erysipelas investigations	3,977	4,895	4,895
(h) Miscellaneous disease investigations	21,698	21,803	21,803
(i) Contagious-abortion investigations	74,480	78,182	78,182
(j) Stock poisoning by plants, investigations of	20,281	20,650	20,650
(k) Poultry disease investigations	26,330	29,890	29,890
(l) Swamp-fever investigations	14,873	15,000	15,000

Projects	1936	1937 (Estimated)	1938 (Estimated)
1. Investigations of nonparasitic diseases of livestock: - Continued.			
(m) Tuberculosis, tuberculin, and reputed immunizing agents, investigations of	$21,543	$22,500	$22,500
(n) Types of tubercle bacilli, investigations of	2,604	3,000	3,000
(o) Johne's disease investigations	2,604	3,000	3,000
(p) Methods of producing immunization against hog cholera, investigations of	16,892	22,495	22,495
(q) Modes of dissemination of hog cholera, investigations of	3,536	5,025	5,025
Total, Investigations of nonparasitic diseases of livestock	261,901	266,460	266,460
2. Investigations of parasitic diseases of animals:			
(a) Index catalogue of medical and veterinary parasitology and maintenance of parasite collection	8,130	8,000	8,000
(b) Poultry parasite investigations	16,870	18,000	18,000
(c) Swine parasite investigations	20,000	21,000	21,000
(d) Parasites causing and transmitting anaplasmosis in cattle	9,500	9,500	9,500
(e) Ox-warble investigations	45,000	45,000	45,000
(f) Liver-fluke investigations	20,000	20,000	20,000
(g) Internal parasites of ruminants, investigations of	14,000	14,000	14,000
(h) Horse parasite investigations	8,000	9,000	9,000
(i) Miscellaneous parasite investigations, cats, wild animals, etc.	17,000	17,000	17,000
(j) Anthelmintics and insecticides for the destruction of parasites, investigations for the development of	9,815	9,815	9,815
Total, Investigations of parasitic diseases of animals	168,315	171,315	171,315
Unobligated balance	7,559	- - -	- - -
Total	437,775(a)	437,775	437,775

(a) For 1936, includes allotments of $28,500 from "Eradicating Tuberculosis" and $27,520 from "Eradicating Hog Cholera" - transferred to this item in the 1937 Estimates.

WORK UNDER THIS APPROPRIATION

General.--The basic research work on animal diseases and parasites, which each year cause tremendous losses to livestock producers, is conducted under this appropriation. It is essential to know the causes of diseases, their mode of dissemination, and the life histories of parasites and their resistance to atmospheric conditions and chemicals before any effectual control or eradication methods may be devised and applied. This essential knowledge is gained only through research and experimentation.

1. Investigations of Nonparasitic Diseases of Livestock.--This project consists of research into methods of diagnosis, cause, mode of transmission, and methods of prevention, treatment, and control of the more important infectious and noninfectious diseases of livestock, including poultry. Work is conducted along the lines indicated in the projects listed below:

(a) Hemorrhagic Septicemia Investigations.--Previous investigations of hemorrhagic septicemia resulted in the development and improvement of biologics for the immunization of animals against this disease, which was responsible for losses in livestock estimated at upwards of a million dollars annually. Althoug these biologics have been effective in controlling the disease as it occurs in acclimated animals on the home premises, no satisfactory utilization of them has yet been found to safeguard the millions of feeder and stocker cattle that become exposed to the shipping-fever form of the disease while in transit from their home ranches and farms to other sections of the country where they are to be fattened. Investigations at this time are directed toward evaluation of systemic alkalinization as a means of controlling the shipping-fever form of the disease.

(b) Equine Encephalomyelitis and Forage-Poisoning Investigations.--Losses in horses in various parts of the country have occurred for many years which until a few years ago had been generally considered to be due to spoiled forage (forage poisoning). Particularly severe losses have occurred in certain years. In 1930 it was shown that a severe epizootic in horses in California was due to an infectious agent, a filterable virus, producing an inflammation of the brain and spinal cord (encephalomyelitis). The specific virus disease has been definitely identified by laboratory means in 20 States and has been diagnosed clinically in 14 other States. Further work is under way to determine positively the existence of the virus disease in the latter States. Additional information is being sought on the modes of transmission, including an explanation of the manner in which the infection is carried over from one epizootic to another; and on improved methods of diagnosis and means of immunizing horses against the disease. Recent outbreaks of a somewhat similar disease following in the wake of the virus infection are being investigated.

(c) Mammitis Investigations.--Mammitis, mastitis, or garget, an inflammation of the udder, is the cause of great loss to the dairy industry. The objects of these investigations are to develop methods of sanitation and hygiene as a means of controlling the disease, to improve methods of diagnosis, to study vaccine therapy in order to develop an effective method of immunization against the disease, and to study modes of transmission of the disease. Recent bacteriological findings and the development of a chemical diagnostic test have been of great value in detecting mastitis in dairy herds, thus assisting owners in handling their breeding and dairy operations in a more efficient manner.

(d) Anaplasmosis Investigations.--Anaplasmosis is a disease of cattle somewhat similar to tick fever. It was definitely recognized in the United States in 1924 and now exists in about 18 States. Control measures employed in other countries are not applicable to this country. The objective in these investigations is to determine the modes of transmission of the disease and to develop a serological test for the diagnosis of the carrier animals. Although means of partially controlling the disease have been found, the development of an immunizing agent that is both safe and effective is an object of these investigations, as well as effective therapeutic means of combating the disease and freeing the carrier animal of infection.

(e) Rabies Investigations.--This project covers studies on the diagnosis and methods of control of rabies in dogs and other animals. In recent years particular attention has been given from time to time to a study of the efficacy of the prophylactic vaccination of dogs as a means of controlling outbreaks of the disease.

(f) Anthrax Investigations.--Present investigations under this project are intended to completely evaluate on a comparative basis the different types of anthrax biologics that are available at the present time, consideration being given to safety, possibility of sensitization, rapidity of immunity production and degree and duration of immunity. This information is needed by veterinarians and livestock sanitary officials to permit a scientific determination of the biologic best suited for each particular herd, the attending circumstances surrounding which may be different from those of other herds. The information recently obtained, while incomplete, has been of material value in controlling anthrax.

(g) Swine Erysipelas Investigations.--It has been found in recent years that swine erysipelas in the acute and chronic form exists in a number of the States. These investigations are conducted in an endeavor to improve on the agglutination test for the diagnosis of the disease so that this may be made available for a practical field test for the diagnosis of the disease. Studies are being made on the factors that enhance the pathogenicity of the causative agent of the disease and on outbreaks of the disease in the field, the latter to gain information on control measures. Experiments are being conducted to develop a safe and effective means of vaccination where the disease occurs in large hog-breeding and feeding establishments.

(h) Miscellaneous Disease Investigations.--The diseases falling in this group, which include glanders, blackleg, paratyphoid infection of swine, foot-rot, alkali disease, and other miscellaneous diseases and pathological conditions of animals, are at this time subjects for study as occasion demands. While some of these diseases were at one time major problems, earlier special studies resulted in finding effective means for their control. The present activities concerning these diseases are largely those of diagnosis, since proper diagnosis is the first essential in formulating measures to combat outbreaks of disease.

(i) Contagious-Abortion Investigations.--Abortion disease has for many years been growing in importance until it now ranks first among diseases that plague the dairy and cattle-raising industries. The object of this research is to gain sufficient knowledge of the disease to be able to at least reduce its ravages and, if possible, bring it under control and eradicate it.

(j) Stock Poisoning by Plants.--In some localities the losses in livestock on account of poisonous plants are frequently very severe. It has been estimated that the average annual damage from such causes is about one million dollars and in exceptional years may reach several times that figure. Work is being carried on to determine what plants are responsible for these losses and to find means to prevent poisoning or to treat affected animals. Recently the causes of various hitherto unexplained livestock sicknesses have been shown to be due to poisonous plants. The relationship between two such plants and the annual loss of several thousand sheep, together with practical means of avoiding them, has been found. A practical and effective remedy for one deadly plant poison has been determined.

(k) Poultry Disease Investigations.--The principal diseases now under investigation are laryngotracheitis, range paralysis, tuberculosis, pullorum disease, and fowl pox. These are widespread in distribution and are the cause of heavy losses to the poultry industry. In addition, a number of diseases to which poultry are susceptible but which are of lesser economic importance are subjects for study as suitable material becomes available and facilities permit. The objective is to formulate adequate control measures.

(l) Swamp-Fever Investigations.--Swamp fever is a widely distributed disease of horses and mules which at times has been of economic importance in certain sections of the United States. In 1927 the disease assumed economic proportions in the Mississippi Delta region, and investigations are now being conducted looking to the development of some treatment that will be effective either as a preventive or as a cure for the disease. Work is being conducted to develop a test for the detection of carriers of the infection as a means of controlling and eventually eradicating the disease.

(m) Tuberculosis, Tuberculin, and Reputed Immunizing Agents.--The investigation of animal tuberculosis was one of the earliest major projects of the Bureau of Animal Industry. Much has been learned of the nature of the disease, the manner in which it is spread, the methods of diagnosis, and means of prevention and control. Present methods of eradicating the disease are based on this work. The object of this investigation is to gain knowledge relative to the disease which will make possible its eradication in cattle, hogs, chickens, and other animals affected by the different types of tubercle bacilli.

(n) Types of Tubercle Bacilli.--In the examination of large numbers of tissue specimens from abattoirs, tubercle bacilli are frequently found in tissues from cattle, swine, and sheep. Such findings serve the purpose of definitely diagnosing the lesions as being tuberculosis in food-producing animals so that proper disposition of the carcass may be made by the meat-inspection service. In other specimens representing lesions found in tuberculin reactor animals slaughtered in connection with the national program of tuberculosis eradication, the finding of tubercle bacilli confirms the tuberculin test. The object of this investigation is to determine the types of tubercle bacilli, whether bovine, human, or avian, that are found in these lesions, in order to furnish the information necessary from the standpoint of tuberculosis eradication.

(o) Johne's Disease.--Johne's disease (paratuberculosis) is a disease of cattle which, like tuberculosis, is caused by acid-fast microorganisms. Like tuberculosis, infection in the early stage of the disease can not be detected by clinical means, yet these animals may be spreaders of the infection to healthy cattle. While the disease has been recognized in the United States for a number of years, it apparently is becoming more prevalent and is causing considerable loss, especially in the dairy industry. A diagnostic agent similar to tuberculin and known as Johnin was developed in 1914. A commercially prepared intravenous Johnin became available in 1927 but proved rather unsatisfactory. In 1932 the Bureau began the preparation of an intradermic Johnin similar to intradermic tuberculin. This product, while more satisfactory than the intravenous Johnin, is as yet in an experimental stage. The object of this investigation is to improve the intradermic Johnin, looking to the ultimate development of a diagnostic agent as effective as intradermic tuberculin and to apply this product in the field for the detection of infected animals so they may be removed from the herds.

(p) Methods of Producing Immunization Against Hog Cholera.--At times hog cholera has severely injured the hog-raising industry, losses having reached 6,000,000 hogs (valued at $65,000,000) in a single year. Present methods of immunization are expensive and not invariably safe or successful, A cheaper and more dependable method is being sought, either through improved utilization of virus and serum or through a harmless but effective vaccine.

(q) Modes of Dissemination of Hog Cholera.--Hog cholera is highly contagious. The avenues by which infectious matter is conveyed from sick hogs to well hogs are studied in order to determine where and how infection may be strategically blocked.

2. Investigations of Parasitic Diseases of Animals.--Investigations are conducted on animal parasites, including studies of their morphology, life history, biology, pathogenicity, and of control measures by means of treatment and prophylaxis. The more important parasite groups covered include the protozoa, nematodes, tapeworms, flukes, insects, and arachnids attacking domesticated and game animals, including birds. The basic work makes possible the precise identification and recognition of parasites and gives the information on which to base control measures. Therapy is established on the basis of critical tests of drugs. Work is conducted along the lines indicated in the projects listed below:

(a) Index Catalogue of Medical and Veterinary Parasitology and Maintenance of Parasite Collection.--The object of this project is to maintain a complete catalogue and index of the world's literature on parasitology. This index catalogue provides a basis for research and affords prompt information in answering correspondence.

(b) Poultry Parasite Investigations.--The poultry industry of the United States suffers large losses because of parasites of poultry. The objective of these investigations is to develop methods of protecting the industry from such losses.

(c) Swine Parasite Investigations.--Swine parasites are the cause of large losses to the industry. The object of the work under this project is to lay a foundation of scientific fact on which to build measures for the

control of parasites and to make available to the industry the data obtained so that losses may be reduced.

(d) Parasites Causing and Transmitting Anaplasmosis in Cattle.--In 1924 and 1925 it was found that anaplasmosis was prevalent in the United States in areas outside the area in which cattle-fever ticks were present, indicating that the eradication of the cattle tick, although resulting in the suppression of piroplasmosis, did not control anaplasmosis. Consequently the problem of anaplasmosis was made a project for consideration, the object being to ascertain what vectors carry anaplasmosis and to develop control measures of any practical sort.

(e) Ox-Warble Investigations.--The object of this project is to lay a foundation for the eradication of ox warbles from the United States, since these parasites cause losses, principally by damage to hides, amounting to millions of dollars annually.

(f) Liver-Fluke Investigations.--A survey of the fluke situation in 1912 indicated that the sheep liver fluke was prevalent along the Pacific Coast and the Gulf Coast, with extensions up certain river valleys to inland States. More recent surveys indicated that the fluke was spreading and was present in about 30 States, including many which were free from flukes in 1912. The damage to cattle livers has become an important item in connection with the increased value of livers in the treatment of pernicious anemia; hence, the evident need for control of this parasite.

(g) Internal Parasites of Ruminants.--Previous investigations have developed or standardized several treatments for stomach worms and other roundworms of sheep. The object of the project is to ascertain the basic facts in connection with cattle and sheep parasites and to develop treatments and control measures. Parasites cause more losses in sheep than do any other disease agencies and in many places are the limiting factor in sheep production.

(h) Horse Parasite Investigations.--Horses in general are menageries of parasites, many of these parasites being highly injurious and the cause of considerable losses. The object of the work under this project is to lay a foundation of scientific fact on which to build control measures and to make available to the people of the United States the data obtained so that losses may be reduced.

(i) Miscellaneous Parasite Investigations, Including Parasites of Dogs, Cats, Wild Animals, etc.--Parasites of sheep, goats, and cattle are identical in many cases with parasites in deer and other wild ruminants, and some of our most important parasites of sheep and cattle have originated as parasites of wild ruminants in recent times. The same is true of parasites of domesticated and wild birds and of other animals, and any competent study of parasites of domesticated animals must take cognizance of parasites of wild animals. A number of parasites of dogs are transmissible to man, and this fact gives the parasites of dogs special importance.

(j) Anthelmintics and Insecticides for the Destruction of Parasites.--The original object of this project was to establish the value of drugs in common use or at least recommended in the literature. This has been done. The next objective was to develop more effective drugs, and this has been done in some cases and is still being carried on effectively. A further objective is to ascertain basic correlations between the efficacy of a drug and the chemical composition and physical properties of the drug, and such investigations are now actively under way.

EMERGENCY FUNDS

Direct Allotments

Projects	Obligated, 1936	Estimated obligations, 1937	Estimated obligations, 1938
Agricultural Adjustment Administration, General Expenses (Jones-Conally Act):			
(transferred to Bureau of Animal Industry for elimination of diseased livestock):			
Combating Bang's disease*....	$14,088,648	- - -	- - -
Combating mastitis.....	486,558	- - -	- - -
Total, A.A.A. Funds.....	14,575,206	- - -	- - -
Section 37 of Act of August 24, 1935:			
Elimination of diseased cattle:			
Combating Bang's disease*.....	446,290	- - -	- - -
Experimentation.....	27,620	- - -	- - -
Total, Section 37 Funds..	473,910	- - -	- - -
Elimination of Diseased Cattle* (Miscellaneous item in Agricultural Appropriation Act reappropriating unobligated balances of funds provided by Jones-Connally Act and Section 37 of Act of August 24, 1935):			
Elimination of diseased cattle:			
Combating Bang's disease*....	- - -	$14,214,000	$14,214,000
Experimentation.....	- - -	150,000	150,000
Total, Elimination of Diseased Cattle.....	- - -	14,364,000	14,364,000

* For explanatory notes on Bangs Disease Work, see separate item "Elimination of Diseased Cattle", under "Miscellaneous".

EMERGENCY FUNDS - Continued

Direct Allotments - Continued

Projects	Obligated, 1936	Estimated obligations, 1937	Estimated obligations, 1938
Emergency Relief Appropriation Act of 1935:			
For eradication of liver flukes in sheep and cattle	$91,000	$109,000	- - -
Emergency Relief Appropriation Act of 1936:			
For eradication of liver flukes in sheep and cattle	- - -	75,000	- - -
Total, Emergency Funds, (Direct Allotments)	15,140,116	14,548,000	14,364,000

(e) ERADICATING TUBERCULOSIS

Appropriation Act, 1937	$1,500,000
Budget Estimate, 1938	1,603,000
Increase	103,000

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)	Increase
1. Eradicating tuberculosis in livestock (including poultry)	$960,457	$1,032,116	$1,032,116	- - -
2. Indemnities for cattle slaughtered on account of tuberculosis	611,407	396,884	499,884	+103,000(1)
3. Tuberculin testing at public stockyards	64,953	71,000	71,000	- - -
Unobligated balance	966,299	- - -	- - -	- - -
Total	2,603,116(a)	1,500,000	1,603,000	+103,000(1)

(a) For 1936, excludes allotment of $28,500 to "Diseases of Animals" (research work), transferred to that item in 1937 Estimates.

INCREASE

(1) An increase of $103,000 in the amount for indemnities for animals slaughtered on account of tuberculosis. During the fiscal year 1935, cattle in a great many counties in various States were tested in order that the areas involved might be re-accredited. It will be necessary to retest the cattle in these counties again during the fiscal year 1938, and it is believed that a sufficient number of reactors will be disclosed to make necessary the expenditure of this additional sum for the payment of indemnities.

WORK UNDER THIS APPROPRIATION

General.--The object of this work is to assist in a campaign to control and eradicate tuberculosis among livestock under a uniform plan in cooperation with the States. This campaign was launched as a Federal-aid project after an extensive survey showed the disease was spreading. The States and livestock owners have looked to the Federal Government for leadership in this work since its inauguration and desire that this assistance be continued, as many failures occurred when independent efforts were employed. Approximately $9,000,000 was appropriated last year by the various States to assist in this campaign.

1. Eradicating Tuberculosis in Livestock (Including Poultry).--The money appropriated for operating expenses is used to employ veterinarians who administer the tuberculin test to individual herds of cattle under a uniform system known as the accredited herd plan, and also participate in administering the tuberculin test to all cattle in a prescribed area under a national program known as the area plan. Veterinarians are also assigned to supervise the work of other cooperating agencies. Traveling expenses of veterinarians, maintenance of field offices, and miscellaneous administrative expenses are also charged against the operating expenses. In connection with the eradication of tuberculosis in poultry, which is a disease produced by the avian type of bacillus, the plan is largely educational, and trained veterinarians demonstrate methods to eliminate the disease. Considerable work is conducted in the more heavily infected sections. This disease is readily transmitted to swine, where it produces tuberculosis in a mild form but causes considerable damage owing to the necessity for destroying certain parts. Some of the fowls are tested with tuberculin to diagnose the disease and locate infection. In addition, this project has been greatly expanded and intensified by the use of funds appropriated by the Act of May 25, 1934 and subsequent legislation.

2. Indemnities for Cattle Slaughtered on Account of Tuberculosis.--This fund is used to reimburse livestock owners in part for losses sustained because of having their cattle slaughtered on account of being affected with tuberculosis. Excellent progress has been made in eradicating tuberculosis in livestock because of the assistance rendered to farmers under this fund. During the fiscal year 1936 Federal indemnity amounting to $611,407 was paid from these regular funds on some 13,337 claims, covering approximately 30,593 tuberculous cattle. In addition, this project has been greatly expanded and intensified by the use of funds appropriated by the Act of May 25, 1934 and subsequent legislation. Payments to owners from these emergency

funds, up to June 30, 1936, totaled $9,084,758, of which $2,325,617 was paid during the fiscal year 1936.

3. Tuberculin Testing at Public Stockyards.--Breeding and dairy cattle offered for interstate shipment from public stockyards are required to be accompanied by a chart showing that they have passed a satisfactory tuberculin test. Bureau veterinarians apply the tests to such animals and certify them for interstate shipment. This activity also includes supervision over the disposition of reactors to the tuberculin test, which are shipped in large numbers in accordance with Federal and State laws to public stockyards to be disposed of for immediate slaughter.

EMERGENCY FUNDS

Direct Allotments

Projects	Obligated, 1936	Estimated obligations, 1937	Estimated obligations, 1938
Agricultural Adjustment Administration, General Expenses (Jones-Connally Act): Transferred to Bureau of Animal Industry for elimination of diseased livestock (eradicating tuberculosis).....	$4,515,722	- - -	- - -
Section 37 of Act of August 24,1935: Elimination of diseased cattle (eradicating tuberculosis).....	1,406,955	- - -	- - -
Elimination of Diseased Cattle (Miscellaneous item in Agricultural Appropriation Act reappropriating unobligated balances of funds by Jones-Connally Act and Section 37 of the Act of August 24, 1935): Elimination of diseased cattle (eradicating tuberculosis).....	- - -	$2,500,000	$1,500,000
Total, Emergency Funds, (Direct Allotments)*.....	5,922,677	2,500,000	1,500,000

* For explanatory notes on Tuberculosis Eradication, see separate item "Elimination of Diseased Cattle," under "Miscellaneous".

(f) ERADICATING CATTLE TICKS

Appropriation Act, 1937	$513,940
Budget Estimate, 1938	513,940

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)
1. Eradicating cattle ticks	$591,408	$513,940	$513,940
Unobligated balance	22,532	- - -	- - -
Total	613,940	513,940	513,940

WORK UNDER THIS APPROPRIATION

This appropriation is used cooperatively for the payment of the salaries and travel and office expenses of veterinarians and agents in Alabama, Arkansas, Florida, Louisiana, Mississippi, and Texas engaged in the eradication of the southern cattle tick, which spreads splenetic fever infection among cattle. As counties are cleaned up they are released from Federal quarantine, and their surplus livestock may then be shipped to markets without restrictions. The States contribute large sums to this work. The work is done under State laws and regulations, Federal money being expended for supervision, thus insuring that all measures of eradication are so carried out as to warrant the release of cleaned areas from quarantine.

EMERGENCY FUNDS

Direct Allotments

Projects	1936	1937 (Estimated)
Emergency Relief Appropriation Act of 1935: For elimination of cattle fever tick	$804,569	$85,581
Emergency Relief Appropriation Act of 1936: For elimination of cattle fever tick	- - -	415,000
Total, Emergency Funds (Direct Allotments)	804,569	500,581

(g) ERADICATING DOURINE

Appropriation Act, 1937.....	$8,613
Budget estimate, 1938.....	- - -
Decrease.....	8,613 (a)

(a) The appropriation for "Eradicating Dourine" has been transferred to and consolidated with the item "Inspection and Quarantine". The 1938 amount for Eradicating Dourine has been reduced by $4,548, as explained under "Inspection and Quarantine".

(h) HOG CHOLERA CONTROL

Appropriation Act, 1937.....	$127,192
Budget Estimate, 1938.....	127,192

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)
Hog cholera control.....	$104,543	$127,192	$127,192
Unobligated balance.....	22,649	- - -	- - -
Total.....	127,192(a)	127,192	127,192

(a) For 1936, excludes allotments of $27,520 to "Diseases of Animals" (research work) and $218,712 to "Virus-Serum-Toxin Act", which amounts were transferred to those items in the 1937 Estimates.

WORK UNDER THIS APPROPRIATION

Under this item work is carried on in the control and eradication of hog cholera in the field by demonstrations, the formation of organizations, and other methods, either independently or in cooperation with farmers' organizations and State and county authorities. Meetings are held and demonstrations are made from time to time to gatherings of farmers and others interested in preventing losses. Outbreaks are investigated, swine diseases diagnosed, owners instructed in methods to prevent losses, and local veterinary practitioners assisted in the use of the preventive treatment. In sections of the South where no veterinary services are available, Bureau inspectors immunize swine in addition to their other duties, and in States where the laws and regulations permit laymen are trained to immunize swine.

(i) INSPECTION AND QUARANTINE

Appropriation Act, 1937	$669,935
Allotment from "Eradicating Dourine" (entire appropriation consolidated with this item)	+8,613
Total available, 1937	678,548
Budget Estimate, 1938	680,000
Increase	1,452

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)	Increase or Decrease
1. Scabies eradication	$163,198	$172,280	$172,280	- - -
2. Control over interstate shipment of livestock for the purpose of preventing the spread of communicable diseases	283,256	299,205	305,205	+6,000(1)
3. Enforcement of the 28-hour law	29,721	29,795	29,795	- - -
4. Determination by inspectors in the field of the existence of diseases	(a) 31,055	(a) 25,478	20,930	-4,548(2)
5. Inspection and quarantine of import animals	78,012	68,920	68,920	- - -
6. Supervision over the importation of hides and other animal by-products, forage, etc	63,277	74,830	74,830	- - -
7. Inspection and testing of animals for export	3,936	8,040	8,040	- - -
Unobligated balance	37,332	- - -	- - -	- - -
Total	(a)689,787	(a) 678,548	680,000	+1,452

(a) Includes $8,613 allotted from "Eradicating Dourine", which item is being merged with "Inspection and Quarantine" in the 1938 Estimates.

INCREASE AND DECREASE

The increase of $1,452 in this item for 1938 consists of:

(1) An increase of $6,000 to provide for inspection of livestock at two additional stockyards, which have been designated as public stockyards, to prevent the spread of communicable diseases; also to furnish additional inspection service at public stockyards in some of the Western States and at some of the Midwest market centers where receipts of livestock have increased to such an extent that the present force is not adequate to provide satisfactory inspection service.

(2) A reduction of $4,548 in the funds for eradicating dourine. The work formerly performed under the appropriation "Eradicating Dourine" has been merged with this project. Because the States involved are not in a position to undertake intensive dourine work, no cooperative eradication

campaign is in prospect at this time. Consequently work is limited to determining extent of existence and preventing spread to new areas.

CHANGES IN LANGUAGE

The words "and dourine in horses" are inserted in this paragraph in order to authorize the work formerly carried on under the appropriation "Eradicating Dourine", which has been eliminated and the funds merged with "Inspection and Quarantine" in the estimates for 1938.

WORK UNDER THIS APPROPRIATION

General.--This appropriation consists of the eradication of scabies in sheep and cattle and of dourine in horses, inspection of southern cattle, control of interstate transportation of livestock, inspection of vessels, enforcement of the 28-hour law, inspection and quarantine of imported animals, including the establishment and maintenance of quarantine stations; supervision over the sanitary handling of hides, skins, wool and other animal byproducts, feeding materials, and fertilizers offered for importation; investigational and inspection activities relative to the existence of contagious diseases, and inspection and mallein testing of animals. All these measures for the safeguarding of this country's livestock are regarded as essential to ward off calamitous results.

1. Scabies Eradication.--Employees are assigned to cooperate with State livestock sanitary officials in inspecting all cattle and sheep in infected areas and in supervising the dipping of all affected or exposed herds or bands. Field forces in the West also cooperate with the Office of Indian Affairs in control and eradication measures on the reservations. The prosecution of this work is essential in order to prevent the spread of the disease to the free areas of the country, which would cause heavy losses to the industry.

2. Control over Interstate Shipment of Livestock for the Purpose of Preventing the Spread of Communicable Diseases.--Under this project is conducted the inspection service at public stockyards. All livestock received are inspected for communicable diseases, and animals found to be affected or exposed are given appropriate treatment or otherwise disposed of in such a way as to prevent the spread of diseases to country points. This service is of value to the producer (a) by affording a means of tracing diseased shipments to origin, thus enabling the local livestock sanitary officers promptly to apply appropriate measures, and (b) by preventing the further movement of diseased and exposed animals, which if it were not prohibited, would disseminate disease to noninfected premises and herds. An important activity under this project is the cleaning and disinfection of cars.

3. Enforcement of the 28-Hour Law.--The work under this project consists of the detection of violations of the law to prevent cruelty to animals in transit. Railroads on the whole are doing their utmost to observe the requirements of this law, and the situation during the past fiscal year was satisfactory.

4. Determination by Inspectors in the Field of the Existence of Diseases.--Funds allotted hereunder are intended to provide for cooperation with local authorities in the suppression of outbreaks of anthrax, glanders, dourine, and other communicable diseases of livestock that are not provided for by a specific appropriation. The funds are used to pay salaries and expenses of employees assigned to such work and other authorized expenditures involved in arresting epizootics of these different diseases.

5. Inspection and Quarantine of Import Animals.--The inspection of all import horses, cattle, other ruminants, and swine is required by act of Congress. Careful inspections at coast and border ports are essential to safeguard our domestic livestock industry from the menace of diseases of foreign origin. During recent years an average of over 600,000 animals has been inspected before importation. In order to fully establish freedom from disease, import animals of certain kinds are held in quarantine at time of entry at our coast and border ports. Quarantine stations are maintained by the Department at New York and Baltimore.

6. Supervision over the Importation of Hides and Other Animal Byproducts, Forage, etc.--Inspectors at ports of entry supervise the sanitary handling and control of import hides, skins, hair, wool, gluestock, fertilizer of certain kinds, manure, previously-used bagging, feeding materials, etc. In order to guard against the introduction of foot-and-mouth disease and rinderpest, shipments not properly certified in the country of origin are shipped in sealed cars to tanneries or other establishments for disinfection in process of manufacture or are otherwise controlled. Measures are taken to guard against the landing and feeding of garbage from ocean vessels provisioned with meat originating in regions in which either foot-and-mouth disease or rinderpest exists; also a check is kept upon importations of dressed poultry from any infected region to assure removal and destruction of the feet.

7. Inspection and Testing of Animals for Export.--Livestock for export are inspected and in certain instances tested and, when found free from disease, certified as provided under specific regulations of this Department and as required by receiving countries.

(j) MEAT INSPECTION

Appropriation Act, 1937.....	$5,258,194
Budget Estimate, 1938.....	5,433,000
Increase.....	174,806

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)	Increase
1. Meat-inspection operations at packing plants under the Federal meat-inspection service...	$5,102,405	$5,113,949	$5,288,755	+$174,806(1
2. Determination of adulterations and other objectionable conditions in meat and meat food products by laboratory analysis.....	81,009	88,600	88,600	- - -
3. Inspection of imported meats and meat food products.....	29,817	29,775	29,775	- - -
4. Chemical, pathological, and zoological investigations relating to meat inspection...	24,959	25,870	25,870	- - -
Unobligated balance.....	116,945	- - -	- - -	- - -
Total.....	5,355,135	5,258,194	5,433,000	+ 174,806(1

INCREASE

(1) The increase of $174,806 for 1938 is needed to meet the demands for inspection at newly established packing plants and on account of the added cost of approximately 35,000 relief days due to increased annual leave from 15 to 26 days a year provided in recent legislation. The trend of the packing industry is away from the large central slaughtering and meat-packing centers to smaller establishments in regions where the livestock is produced. This decentralization of operations is less economical to the Bureau in the assignment of required regulatory supervision, as it requires more employees to conduct inspection at a number of small, widely-spread establishments than at a few very large establishments where an equal number or more animals will be slaughtered during a given period. There are on file at this time applications from 25 companies which are actively preparing their plants in order that they may be granted Federal inspection.

It has been found impossible to maintain the high efficiency of the meat-inspection service and grant additional leave in accordance with recent Congressional action without a very material increase in personnel. Funds are urgently needed for this purpose. While every possible arrangement is effected to double up on assignments of inspectors where that is possible, the nature of much of the work of meat inspection is such that an inspector

must be at his post during certain designated periods. This makes it impossible to comply with the leave legislation without additional employees for relief assignments.

CHANGES IN LANGUAGE

The statute citation in this paragraph has been amended to conform with the latest edition of the United States Code.

WORK UNDER THIS APPROPRIATION

General.--The purpose of the Meat Inspection Service is to eliminate and dispose of carcasses and meat food products found to be diseased, unwholesome, or otherwise unfit for use as human food; to see that meat and meat food products for human consumption are prepared in a cleanly manner; to guard against the use of harmful dyes, chemicals, and other deleterious substances; to prevent the use of false or misleading names or statements on labels; and to supervise the interstate transportation, exportation, and importation of meat and meat food products.

1. Meat-Inspection Operations at Packing Plants under the Federal Meat Inspection Service.--The object of this work is to see that the laws and regulations governing meat inspection are properly observed. The inspection includes ante-mortem and post-mortem examinations of the animals to determine any disease or condition that might render the meat or any organ unfit for food purposes; enforcement of sanitary requirements; supervision of the preparation and processing of the meat and products; reinspection of meat and meat products at various stages of processing and handling; supervision of the destruction for food purposes of all condemned meat and products; and supervision of the labeling and marking of the meat and product.

2. Determination of Adulterations and Other Objectionable Conditions in Meat and Meat Food Products by Laboratory Analysis.--The purpose of this project is to ascertain whether meat and meat food products are prepared in official establishments or under exemption or shipped interstate by farmers, as well as imported meats and meat food products, are properly labeled, sound, healthful, wholesome, and otherwise fit for human consumption, and to determine whether any prohibited substance has been used in their preparation or in or about the establishment; also to determine whether the water and ice used in the preparation of meat and meat food products are potable.

3. Inspection of Imported Meats and Meat Food Products.--This work seeks to prevent the importation of meat and meat food products of cattle, sheep, swine, and goats which are not properly certified or which are falsely labeled or which are unsound, unhealthful, unwholesome, or otherwise unfit for use as human food or which contain any prohibited dye, chemical, preservative, or other harmful ingredients.

4. Chemical, Pathological, and Zoological Investigations Relating to Meat Inspection.--Under this project are conducted such research and investigations as may be necessary to determine proper procedures to be followed in conducting the inspection and proper diagnoses and disposition of meat and products.

(k) VIRUS-SERUM-TOXIN ACT

Appropriation Act, 1937..... $218,712
Budget Estimate, 1938..... 218,712

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)
Control over the manufacture, importation and shipment of viruses, serums, toxins, etc.....	$214,437	$218,712	$218,712
Unobligated balance.....	4,275	- - -	- - -
Total.....	(a)218,712	218,712	218,712

(a) For 1936 represents an allotment from "Eradicating Hog Cholera", this amount being actually transferred from the latter appropriation in 1937 to set up the new item "Virus-Serum-Toxin Act".

WORK UNDER THIS APPROPRIATION

This item provides for the enforcement of the provisions of the Virus-Serum-Toxin Act, approved March 4, 1913, regulating the preparation, sale, barter, exchange, or shipment of viruses, serums, toxins, or analogous products produced in the United States and the importation of such products intended for use in the treatment of domestic animals. All the animals used in producing these biological products are inspected. Careful attention is given to sanitation, labeling, and the testing of the finished products for purity and potency.

(l) MARKETING AGREEMENTS WITH RESPECT TO HOG CHOLERA VIRUS AND SERUM

Authority: First Deficiency Appropriation Act, fiscal year 1936 (for use during 1937)..... $30,000 (a)
Budget Estimate, 1938..... 30,000 (a)

(a) Transferred and payable from the $100,000,000 appropriation provided by Sec. 12 (a), Title I, of the Agricultural Adjustment Act of May 12, 1933. (See item "Salaries and Expenses, Agricultural Adjustment Administration".)

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)
Marketing agreements with respect to hog cholera virus and serum.....	- - -	$30,000	$30,000
Received by transfer from "Salaries and Expenses, Agricultural Adjustment Administration".....	- - -	- 30,000	- 30,000
Total.....	- - -	- - -	- - -

CHANGES IN LANGUAGE

The language of this item is identical with that carried in the First Deficiency Appropriation Act, fiscal year 1936, except that "fiscal years 1936 and 1937" has been changed to "1938" and the statute reference has been amended.

WORK UNDER THIS APPROPRIATION

This item provides funds for the enforcement of sections 56 to 60, inclusive, of the Act approved August 24, 1935 (49 Stat., 781, 782), entitled "An Act to amend the Agricultural Adjustment Act and for other purposes". Such marketing agreements are intended to insure the maintenance of an adequate supply of anti-hog-cholera serum and hog-cholera virus for hog producers and to aid in making other improvements in trade conditions. The Department exercises supervision over agencies that may be established under the provisions of such agreements, receives reports of their activities, and reviews their acts, orders, and the like.

(m) PACKERS AND STOCKYARDS ACT

Appropriation Act, 1937..... $381,879
Budget Estimate, 1938..... 381,879

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)
Enforcement of the Packers and Stockyards Act.....	$323,719	$381,879	$381,879
Unobligated balance.....	8,160	- - -	- - -
Total.....	331,879	381,879	381,879

CHANGES IN LANGUAGE

The statute citation has been amended to conform with the latest edition of the United States Code.

WORK UNDER THIS APPROPRIATION

The work under this appropriation embraces supervision of the business of packers, stockyard owners, market agencies, dealers, and licensees engaged in interstate commerce, and includes regulation of practices and rates and charges for service rendered at posted stockyards and certain designated poultry markets.

Jurisdiction is exercised through 20 field offices over approximately 1,300 market agencies, 3,200 dealers at 93 stockyards, 1,200 packers, and a large number of licensees throughout the country. Varied activities are carried on under this project, the more important of which are (1) the registration and bonding of market agencies and dealers at posted stockyards and the licensing of live-poultry handlers in designated cities; (2) supervision of the testing and maintenance of livestock scales at posted stockyards and of live-poultry scales in designated cities; (3) valuation of the properties of stockyard companies and licensees, in including inventories and appraisals of the real estate and physical structures of such companies and licensees, together with comprehensive analyses of their financial operations and organizations and complete audits of their books and records, for the purpose of obtaining information for the use of the Secretary of Agriculture in determining the reasonableness and the lawfulness of rates and charges for stockyard services rendered by stockyard companies and for services and facilities furnished by licensees; (4) investigations of the operations of commission men handling livestock and live poultry, and audits and analyses of their books and records in connection with the determination of rates which would be reasonable for them to charge for the purchase and sale of livestock at public markets and of live poultry in designated cities; and (5) investigations of complaints as to unfair and unjustly discriminatory practices on the part of market agencies, dealers, stockyard companies, packers and licensees.

(n) ERADICATION OF FOOT-AND-MOUTH AND OTHER CONTAGIOUS DISEASES OF ANIMALS

This item continues the availability of the unexpended balance of the appropriation of $3,500,000 made in 1924 to be used in case of an emergency arising from an outbreak of foot-and-mouth or other contagious diseases of animals. The unexpended balance on June 30, 1936, was $1,315,000. No expenditures are contemplated during the fiscal year 1937 unless an emergency arises, but the availability of this fund is essential to insure protection of the American livestock industry should an outbreak occur.

CHANGE IN LANGUAGE

With the exception of the proviso for the control of the European fowl pest and similar diseases in poultry, this item is believed to be permanent

legislation. The fowl-pest proviso in the 1938 estimates has been amended so as to make an annual appropriation of $5,000 available for this purpose during any fiscal year. It is proposed to continue this item, amended as indicated, in the estimates for 1938, and, in the meantime, to submit the matter to the Comptroller General, with a view to the entire elimination of the item in future years in case he construes the legislation to be permanent in character, making unnecessary its repetition from year to year.

EMERGENCY FUNDS
(Complete Bureau Statement)

(1) Direct Allotments

Projects	Obligated, 1936	Estimated obligations, 1937	Estimated obligations, 1938
Agricultural Adjustment Administration (transferred to Bureau of Animal Industry):			
Salaries and Expenses:			
For Sixth World's Poultry Congress 1936 (traveling expenses of official delegates, authorized by Act of June 20, 1936)	- - -	$8,000	- - -
For field investigations in carrying out agricultural adjustment program	$975	- - -	- - -
General Expenses (Jones-Connally Act):			
Elimination of diseased livestock:			
Eradicating tuberculosis	4,515,722	- - -	- - -
Combating Bang's disease	14,088,648	- - -	- - -
Combating mastitis	486,558	- - -	- - -
Total, A.A.A. Funds	19,091,903	8,000	- - -
Section 37 of Act of August 24, 1935:			
Elimination of diseased cattle:			
Eradicating tuberculosis	1,406,955	- - -	- - -
Combating Bang's disease	446,290	- - -	- - -
Experimentation	27,620	- - -	- - -
Total, Section 37 Funds	1,880,865	- - -	- - -
Elimination of Diseased Cattle (Miscellaneous item in Agricultural Appropriation Act reappropriating unobligated balances of funds appropriated by Jones-Connally Act and Section 37 of Act of August 24, 1935):			
Elimination of diseased cattle:			
Eradicating tuberculosis	- - -	2,500,000	$1,500,000
Combating Bang's disease	- - -	14,214,000	14,214,000
Experimentation	- - -	150,000	150,000
Total, Elimination of Diseased Cattle	- - -	16,864,000	15,864,000

Projects	Obligated, 1936	Estimated obligations, 1937	Estimated obligations, 1938
Emergency Relief Appropriation Act, 1935:			
For elimination of cattle fever tick.....	$804,569	$85,581	- - -
For eradication of liver flukes in sheep and cattle.....	91,000	109,000	- - -
For physical improvements at Chinsegut Hill Sanctuary, Brooksville, Fla.....	28,520	380	- - -
Total, Emergency Relief Act, 1935...	924,089	194,961	- - -
Emergency Relief Appropriation Act, 1936:			
For elimination of cattle fever tick.....	- - -	415,000	- - -
For eradication of liver flukes in sheep and cattle.....	- - -	75,000	- - -
Total, Emergency Relief Act, 1936	- - -	490,000	- - -
Public Works Allotments (National Industrial Recovery Act): For completion of physical improvements begun in 1934:			
Brooksville, Florida:			
Cattle barn, feed lots, silos, etc.....	- - -	7,500	- - -
Beltsville, Maryland:			
Fencing and fence repairs.....	92	- - -	- - -
Completion of poultry fattening building.....	803	- - -	- - -
Sheep barn.....	150	- - -	- - -
Building for storage of farm machinery, equipment, and supplies.....	3,598	- - -	- - -
Repairing refrigeration system.....	9,300	- - -	- - -
Repairs to beef-cattle barn, bull pens, calf sheds, and lot.....	181	- - -	- - -
Roads and bridges on farm.....	84	- - -	- - -
Dual-purpose cattle barn.....	237	- - -	- - -
Engineering administration and incidental expenses for animal-industry projects; nutrition laboratory.....	124	- - -	- - -
New animal shelters (animal parasite studies).....	37	- - -	- - -
Isolation laboratory (animal parasite studies).....	25	- - -	- - -
Main laboratory building (animal parasite studies).....	47	- - -	- - -

Projects	Obligated, 1936	Estimated obligations, 1937	Estimated obligations, 1938
Beltsville, Maryland (continued):			
Nutrition laboratory, repair and extension of water system; reconditioning farm power line; completion of poultry fattening building; farm roads and bridges; goat barn and milk production equipment; moving hog equipment; physical improvements for poultry production record project; physical improvements for turkey breeding, nutrition and management project; consulting engineering and architectural services and overhead expenses for Beltsville experimental farm; transportation and supervision of labor furnished by F.E.R.A. used in fence, water supply, sewer, and road construction and in clearing land; transient camp for F.E.R.A. labor	$28,747	$3,641	- - -
General administrative expenses; repair and extension of farm water system; transportation and supervision of labor furnished by F.E.R.A. used in fence, water supply, sewer, and road construction and in clearing land	2,719	- - -	- - -
Poultry building; completion of poultry fattening building; physical improvements for poultry record-of-performance project	4,087	- - -	- - -
Fundamental poultry research building; repair and extension of farm water system; completion of poultry fattening building; physical improvements for turkey breeding, nutrition, and management project	2,683	- - -	- - -
Moving present frame buildings to new sites; completion of poultry fattening building	617	- - -	- - -
Laying houses (2)	258	- - -	- - -
Moving hog equipment; preparing sewer plans	1,948	- - -	- - -
Purchase of additional land	909	- - -	- - -
Moving Bethesda station to Beltsville	840	- - -	- - -
Change of location of main work-horse barn and site for main laboratory building	7	- - -	- - -
Miles City, Montana:			
Rearranging buildings and facilities for slaughtering, cooling, cutting, and curing under farm conditions	1,595	- - -	- - -
Beef and dual-purpose cattle building, and equipment and building for horses	6,278	- - -	- - -

Projects	Obligated, 1936	Estimated obligations, 1937	Estimated obligations, 1938
Middlebury, Vermont:			
Fencing	$66	- - -	- - -
Sheep barn repairs	213	- - -	- - -
Remodeling of cattle and horse barns and painting of buildings	89	- - -	- - -
Total, P.W.A. Allotments (National Industrial Recovery)	65,734	$11,141	- - -
Public Works Administration (Emergency Appropriation Act, 1935):			
Beltsville, Maryland:			
Completion of poultry fattening building	- - -	20,260	- - -
Repairing refrigeration system	1,081	- - -	- - -
Nutrition laboratory, repair and extension of water system; reconditioning farm power line; completion of poultry fattening building; farm roads and bridges; goat barn and milk-production equipment; moving hog equipment; physical improvements for poultry-production record project; physical improvements for turkey breeding, nutrition, and management project; consulting engineering and architectural services and overhead expenses for Beltsville experimental farm; transportation and supervision of labor furnished by F.E.R.A. used in fence, water-supply, sewer, and road construction and in clearing land; transient camp for F.E.R.A. labor	19,680	148,930	- - -
Poultry building; completion of poultry-fattening building; physical improvements for poultry record-of-performance project	- - -	720	- - -
Fundamental poultry research building; repair and extension of farm water system; completion of poultry-fattening building; physical improvements for turkey breeding, nutrition, and management project	- - -	25,668	- - -
Moving Bethesda station to Beltsville	- - -	3,308	- - -
General completion of entire poultry plant, including sidewalks, painting, road drainage, storage shed, and hard surfacing roads	- - -	12,215	- - -
Total, Public Works Administration (Emergency Appropriation Act, 1935)	20,761	211,101	- - -

Projects	Obligated, 1936	Estimated obligations, 1937	Estimated obligations, 1938
Total, Emergency Funds (Direct Allotments).....	$21,983,352	$17,779,203	$15,864,000

(2) Indirect Allotments
(Financed through other Government agencies)

Projects	Obligated, 1936	Estimated obligations, 1937
Emergency Conservation Work (authorized by Acts of March 31, 1933, and April 8, 1935; allotment through War Department): Work of Civilian Conservation Corps in clearing land, building roads, and constructing fences, drainage ditches, pipe-line, etc., at livestock experiment stations at Beltsville, Md., and Brooksville, Fla.....	$217,714	$141,750

PASSENGER-CARRYING VEHICLES

The authorization for the purchase of passenger-carrying vehicles for the Bureau of Animal Industry contemplates an increase of $17,155 ($54,300 in 1937; $71,455 estimated for 1938) for this purpose. This $71,455 will permit the Bureau to replace 100 old vehicles at an average cost of $579 each after exchange allowances are deducted, as well as to purchase 21 additional vehicles at an average cost of $645 each. Of the 21 additional cars, 4 are for use at our experimental farms in rural sections where public transportation in any form is not available; 15 are for use in travel from farm to farm by veterinarians engaged in cooperation with the States in the eradication of tuberculosis in cattle throughout the country, the eradication of cattle ticks in the Southern States, and the eradication of hog cholera; and two for travel to abattoirs and meat-packing plants at centers where establishments are located at widely separated points not readily and economically accessible by public transportation.

The Bureau is unable to carry on economically and efficiently its varied activities in the field by the use of public transportation and therefore, where Government-owned cars are not available, it is necessary to reimburse employees for operation of their personally-owned cars. We are now operating 400 vehicles in the field and have found their use considerably less expensive than the practice of reimbursing employees for the operation of their own cars.

We have found that in almost every section of the country Government-owned cars can be operated for our work (purchase price, plus operation charges, less trade-in allowance) for approximately 3 cents a mile. All the cars to be replaced are of such an age that they can no longer be operated economically, the average mileage being over 40,000 and in a number of cases as high as 60,000. It has been the experience of the Bureau that the elements of age, mileage, and type of usage must all be taken into consideration when replacement of cars is considered, in order to reduce the expense of operating Government-owned cars. The funds requested in 1938 will permit the replacement of but one-fourth of the Bureau's cars. Most of our cars are in use daily on rural inspectional work, involving in many cases an average of 18,000 miles a year, and it would therefore appear necessary, if mileage costs are kept at the lowest point possible, to replace all vehicles, on an average, at least every four years.

BUREAU OF DAIRY INDUSTRY

(a) GENERAL ADMINISTRATIVE EXPENSES

Appropriation Act, 1937	$67,995
Allotment from "Dairy Investigations"	+2,500 (a)
Total available, 1937	70,495
Budget Estimate, 1938	70,495

(a) Carried forward by means of transfer in the estimates for 1938, to provide necessary additional funds for conducting the various administrative activities of the Bureau. The appropriation for "Dairy Investigations" is reduced accordingly in the estimates for 1938.

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)
General administration and business service	$67,951	$70,495	$70,495
Unobligated balance	124	---	---
Total appropriation	68,075(a)	70,495	70,495

(a) For 1936 includes $2,000 allotted from "Dairy Investigations"

WORK UNDER THIS APPROPRIATION

The work conducted under this appropriation includes the direction of research, engineering, information, library, and service activities, the administration of fiscal and property work, and general supervision of personnel.

(b) DAIRY INVESTIGATIONS

Appropriation Act, 1937	$629,099
Allotment to "General Administrative Expenses, Bureau of Dairy Industry"	-2,500 (a)
Total available, 1937	626,599
Budget Estimate, 1938	653,500
Increase	26,901

(a) Carried forward by means of transfer in the estimates for 1938.

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)	Increase
1. Investigations of milk and butterfat production of dairy cows:				
(a) Investigations of inheritance of milk and butterfat production	$163,660	$155,005	$172,905	+$17,900(1-a)
(b) Investigations of physiology of milk secretion and reproduction	16,454	16,327	16,327	- - -
(c) Investigations of relation of conformation to producing ability	13,966	13,951	13,951	- - -
(d) Investigations of the effect of proteins, minerals, vitamins, and other basic elements of nutrition on milk secretion and health of animals	74,805	73,153	73,153	- - -
(e) Investigations of the influence of feeding and management on level and cost of milk production and growth	68,818	68,036	70,437	+ 2,401(1-b)
(f) Studies of dairy-herd improvement association records to determine the effect of the application of breeding and feeding practices on level and economy of production	57,289	88,750	88,750	- - -
Total, Investigations of milk and butterfat production of dairy cows	394,992	415,222	435,523	+20,301(1)
2. Market-milk investigations:				
(a) Dairy sanitation research	9,035	11,978	11,978	- - -
(b) Milk-plant management investigations	4,016	7,986	7,986	- - -
(c) Milk quality improvement investigations	10,713	12,156	12,156	- - -
Total, Market-milk investigations	23,764	32,120	32,120	- - -

PROJECT STATEMENT (Cont'd)

Projects	1936	1937 (Estimated)	1938 (Estimated)	Increase
3. Investigations of the utilization of milk in the manufacture of milk products:				
(a) Basic investigations of the bacteriology and chemistry of milk.....	$13,515	$18,727	$18,727	- - -
(b) General investigations of ice cream manufacture.....	12,752	16,571	16,571	- - -
(c) General investigations of the manufacture of butter and byproducts.....	18,903	32,324	34,924	+$2,600(2-a)
(d) Condensed, evaporated, and dried milk investigations..	25,560	37,922	37,922	- - -
(e) General investigations of cheese manufacture.....	28,606	40,682	40,682	- - -
(f) Factory investigations for quality improvement of butter, cheese and other milk products	29,070	- - -	- - -	- - -
(g) Introduction into commercial factories of new and improved methods of manufacturing milk products and byproducts.....	17,927	- - -	- - -	- - -
(h) State and industry relations for milk products manufacture	- - -	26,031	30,031	+4,000(2-b)
(i) Inspection of renovated butter factories and of dairy products for export (regulatory work)	1,453	7,000	7,000	- - -
Total, Investigations of the utilization of milk in the manufacture of milk products.....	147,786	179,257	185,857	+6,600 (2)
Total obligated.....	566,542	626,599	653,500	+26,901
Unobligated balance.....	36,977	- - -	- - -	- - -
Total appropriation.....	603,519(a)	626,599	653,500	+26,901

(a) For 1936 excludes $2,000 allotted to "General Administrative Expenses."

INCREASES

The increase of $26,901 in this item for 1938 consists of:

(1) An increase of $20,301 for investigations of milk and butterfat production of dairy cows, as follows:

(a) $17,900 for studies of inheritance of milk and butterfat production qualities in dairy cattle, including:

$4,500 for development of breeding investigations. Breeding experiments have been under way for a number of years at the Beltsville station in which different systems of mating are being compared for their efficiency in determining the hereditary factors for high levels of production. One part of the experiment calls for the use of unrelated sires that have shown by progeny tests that they possess in their hereditary make-up the factors for high-producing ability. Since the hereditary make-up of a sire can not be determined before he is 6 years of age and, on the average, the sires are not definitely proved before they reach the age of 8 years, and since the average age at which fertility ceases in bulls has been around 11 years (the maximum age that any sire in our experiments has reached with vigor of fertility being 16 years), it becomes necessary from time to time to purchase proved sires. The experimental projects in breeding at the Beltsville station require the use of 4 to 5 sires of proved ability. The increase recommended will provide for the purchase of sires that have been proved to possess the hereditary factors for high level of production.

$11,000 for the development of a herd of dairy cattle genetically pure for a low level of milk production. The establishment of a pure low-producing herd of dairy cattle would supplement and strengthen the breeding investigations being conducted by making available needed material for crossing with pure high-producing groups. These crosses will aid in clearing up controversial questions and theories regarding a number of factors controlling milk production, lack of dominance or partial dominance of high over low, or vice versa, sex linkage, and other theories now being advanced without adequate experimental backing.

The females in the low-producing herd will provide supplementary post-mortem material for exploring the possibilities of physical deficiencies which may be associated with the lack of milk-producing ability. The work will also throw light on the relationship of accepted type of ability to produce.

Approximately 25 females and one male will be required at the beginning of this project. Future sires for use in the project will develop from the foundation stock. A total of 40 head would be the maximum number of animals used in the project at any one time.

$2,400 for additional facilities at regional dairy experiment stations. This increase and the increase of $2,401 under (1-b), or a total of $4,801, will provide additional facilities for the breeding, feeding, and management experiments conducted at seven regional dairy experiment stations. During the past few years droughts have so seriously interfered with the raising of feed crops that the budgets of these stations have had to be used almost entirely for the purchase of feeds to maintain the experimental breeding herds, although the size of the herds has been materially reduced. In some cases the herds have had to be reduced to animals so young in age that certain phases of the investigational work had to be temporarily abandoned. The increased funds will provide for the purchase of proved sires for rebuilding the breeding herds of these stations and for the repair and improvement of buildings and the replacement of equipment which have deteriorated to a marked degree during the past few years.

(b) $2,401 for additional facilities at regional dairy experiment stations. This is part of the increase referred to in the preceding paragraph.

(2) An increase of $6,600 for strengthening the work in the utilization of milk in the manufacture of milk products, as follows:

(a) $2,600 for development of commercial sources for utilization of skim milk, buttermilk, and whey. In the manufacture of butter, cheese, and other major dairy products there is produced annually about 25 billion pounds of skim milk, 3 billion pounds of buttermilk, and 4-1/2 billion pounds of whey, containing 2-1/2 billion pounds of digestible nutrients. This is about two-thirds of the total nutrients in the milk from which it originated. Converted into pork or poultry, only about 10 percent of the digestible nutrients is recovered as human food. The farm value of this material for feeding purposes may be estimated at $100,000,000, while, if it could be converted into material directly available for human food, its value would be about doubled.

There are two lines of approach to this problem. The several ingredients of milk may be separated and converted into material having uses in various industries. These include casein for paper coating, adhesives, paints, imitation wool, and probably many other fields not yet explored. Milk sugar has possible applications in explosives, candies, and foodstuffs. A second possibility is through combination with cereals, fruits, and other farm products to develop new foods or to improve the palatibility, nutritive value, and keeping quality of those already established. The existing personnel is inadequate to handle this problem.

(b) $4,000 for further development of the commercial introduction of processes for manufacturing milk products. The work is handicapped by a lack of efficient machinery for establishing commercially new methods or products on a scale that would have any appreciable effect on the industry. The Bureau of Dairy Industry as a national organization should assume responsibility for building a branch of the industry when such a course is in the public interest.

Failure of the Bureau's program to meet conditions is illustrated by the Roquefort cheese situation. It has been known for many years how to make a cheese from cow's milk which compares favorably with the French sheep's milk cheese. This has been demonstrated on a small commercial scale but has had no effect on the industry as a whole. In the meantime a Danish Roquefort has been developed, introduced into this country, and is already being sold in rapidly increasing quantities. Every month that passes makes it more difficult to establish an American cheese of similar type.

The Bureau now has ready for commercial introduction a Roquefort-type cheese, a Bel Paese cheese, and a canned Cheddar cheese. The shipment of milk in concentrated frozen form is also another development which presents great possibilities for commercial exploitation. The Bureau should be prepared to give information about equipment required and its cost, construction, and control of curing rooms, cost of manufacture, markets, and other questions which always arise when a new project is proposed. It should be collecting information and establishing contacts wherever local conditions are found to be favorable to the establishment of new manufacturing enterprises.

Conditions in Pennsylvania at the present time may be cited as an illustration of how this program would work in practice. There are in that State numerous natural caves and mines, many of which could probably be converted into curing rooms suitable for Roquefort or Bel Paese cheese. Naturally-cooled curing rooms are not essential but will be a factor in reducing the cost of manufacture to a point at which the Danish competition can be met.

One Roquefort factory using a coal mine and a Bel Paese factory with artificially-controlled curing rooms are already established with good prospects of success. Pending the demonstration that these factories are financially successful, other locations should be found where there is a combination of natural curing rooms, milk at cheese prices, and some agency interested in establishing a factory.

This work should be conducted in cooperation with the State colleges, and as the work progresses someone should be given sufficient training and experience to permit the eventual withdrawal of the Bureau forces. As soon as one factory is established and able to go alone, the Bureau men should be moved to a new factory and eventually entirely withdrawn, leaving the supervision of the established factories and the extension of the field to State agencies with only occasional assistance from the Bureau. The Bureau men would then be available for similar work in other sections or on other projects.

At the present time there is a serious shortage of milk in the subtropical possessions of the United States. Milk retails at from 18 to 20 cents per quart and the supply at this price is insufficient. We are informed by the Department of Commerce that there is a market for 8,000 to 10,000 pounds of milk daily in the Canal Zone. It has been demonstrated that milk may be concentrated, frozen, and delivered in consumer packages in excellent condition in the Canal Zone four or five weeks after it is produced. This can be done at a price probably not exceeding 14 cents per quart. Similar conditions, no doubt, exist in Puerto Rico, Hawaii, and the Philippines. Through this new process it should be possible to establish a market for many million pounds of American milk.

Personnel is available for this work but it can not be carried out on an adequate scale without additional funds for travel expenses. In many of the projects some portable equipment must be provided for proper control of the manufacturing processes.

WORK UNDER THIS APPROPRIATION

General.--The work conducted under this appropriation involves scientific research and experimentation in practically every phase of the dairy industry. It contemplates the development of fundamental principles of dairy-cattle breeding, feeding, and management; problems in sanitary and economical methods of producing, transporting, processing, and distributing market milk and cream for utilization in fluid form; new methods of manufacturing dairy products and the improvement of existing methods of manufacture; the effective utilization of dairy byproducts through the development of new uses for such byproducts; and the introduction of such new and improved processes of manufacture into commercial creameries and cheese factories.

1. Investigations of Milk and Butterfat Production of Dairy Cows.--There are about 25,000,000 milk cows in the United States at present. These animals

are fed and cared for on 4,900,000 farms, or on about 73 percent of all of the farms of the country. There are approximately 20,000,000 people occupied part or full time in milking and caring for these cows. In normal years the farm value of our dairy products exceeds $2,000,000,000.

Although the total money value of the dairy industry compares favorably in magnitude with that of other great industries, its individual units are small and under the ownership and direction of a large number of people. This divided ownership makes it impossible for the industry itself to conduct research for its advancement and guidance, as in the case of other great industries that are under centralized control. Since dairying is an industry that affects the livelihood of so many people, and to a great extent the health of all the people, and since upon it the continued fertility of our soils largely depends, its advancement and welfare is a matter of national importance.

That help is needed by dairy-cattlemen is shown by the low average production per cow -- estimated for 1935 to be 4,169 pounds of milk containing 164.2 pounds of butterfat. Only about one-third of these 25,000,000 cows produce enough to return a profit to their owners.

Investigations of improved methods of breeding, feeding, pasturing, housing, management, testing, and judging dairy cows, so that the business of dairy farming will be made more efficient and more profitable and that dairy farmers can produce a product most beneficial to the consumer from the standpoint of quality, safety, and nutritive value, and at a cost that will be well within the buying power of the consumer, are being conducted by the Bureau of Dairy Industry through its Divisions of Dairy Cattle Breeding, Feeding, and Management; Dairy Research Laboratories (Section of Nutrition Investigations); and Dairy Herd Improvement Investigations, as follows:

(a) Investigations of Inheritance of Milk and Butterfat Production are conducted to determine the comparative effects of out-breeding, line-breeding, and inbreeding in fixing an inheritance for high and uniform levels of producing ability in dairy cows; and to test the possibilities of breeding strains pure for high levels of production by the continued use of sires that have demonstrated that they possess an inheritance for high levels of production.

(b) Investigations of Physiology of Milk Secretion and Reproduction.-- These investigations have indicated that a hormone of the pituitary gland is an important agent in normal milk secretion in dairy cows and may prove low production in some animals to be the result of a deficiency of this hormone, possibly hereditary in some strains. The effects of certain hormone injections in prolonging the period of fertility in aged bulls are being studied. Investigations to determine the effect of various factors on the fertility of dairy animals is another phase of the work under this project. Few sires breed beyond 10 years of age, and their transmitting ability can not be definitely established until they are from 6 to 8 years of age. Sterility in dairy cows is causing enormous losses to dairy farmers annually. It is estimated that approximately 20 percent of all cows eliminated from all dairy herds of the country are disposed of because of sterility. The object of the investigational work conducted, therefore, is to determine the effect of certain dietary regimes in the correction and prevention of certain forms of sterility and the effect of consistent exercise on the fertility of males and females. This work is especially important in extending the useful life of valuable breeding sires. Many cases of

sterility have been corrected by control of the diet and through exercise. Artificial insemination as a means of expanding the use of valuable breeding stock is being given close study. All phases of this practice are being covered, including a method of extracting semen from the males; the best procedure for depositing sperm in the genital tract of the female, and methods of preserving and prolonging the life of sperm cells to enable their wider use. The time of ovulation is being investigated to determine the optimum time of mating in relation to the period of oestrum for securing pregnancy.

(c) Investigations of Relation of Conformation to Producing Ability are carried on for the purpose of determining the relationship, if any, between conformation and anatomy of dairy cows to their producing ability, and to establish, if possible, a scientific basis for judging and selecting dairy cattle from outward appearance.

(d) Investigations of the Effects of Proteins, Minerals, Vitamins, and Other Basic Elements of Nutrition on Milk Secretion and Health of Animals.--The The investigations being conducted under this project contemplate the determination of the essential elements of a ration which will maintain a cow in good health and maximum milk production. It is evident that in many cases the milk yield is limited by specific factors which are lacking in rations considered ample by the usual standards, and that continued subsistence on a ration deficient in some respect may result in failure of reproductive functions and in failure to resist infection. For example, it has been found that different kinds and grades of roughages have a marked effect upon reproduction in dairy cattle. About 15 percent of the calvings of cows on pasture or when fed No. 1 alfalfa hay as their sole roughage are abnormal. The percentage of abnormal calving, however, ranges from 57 to 80 percent when the sole roughages are timothy or No. 3 alfalfa hay. The feeding of cod-liver oil or carrots to animals receiving No. 3 timothy hay increased the percentage of normal calvings. It would seem, therefore, that the large proportion of abnormal calving of cattle on a No. 3 timothy hay ration is due to a deficiency of carotene or Vitamin A.

The importance of the quality of the roughage in determining the vitamin potency of the milk is indicated by the fact that calves which have been fed on whole milk produced by cows on No. 3 alfalfa or No. 3 timothy and are weaned onto a ration of hay of this same quality do not survive. If this ration is supplemented by cod-liver oil or other satisfactory source of Vitamin A normal growth is obtained. No material acceleration of growth is obtained by adding cod-liver oil to a ration containing No. 1 alfalfa, indicating that roughage of this quality provides ample Vitamin A. However, for some reason still unknown, an excess of cod-liver oil is toxic to calves.

(e) Investigations of Influence of Feeding and Management on Level and Cost of Milk Production and Growth.--The object of this project is to determine the influence of various feedstuffs on the growth and milk production of dairy cows; the comparative values of various roughages when cut at different stages of maturity and when made into hay or silage; the effect of fertilization and rotational grazing on the value of pastures for milk production; and the effect of various methods of handling, milking, feeding, exercising, and pasturing on the economy and level of milk production. Artificial drying of roughages is being tried out experimentally. The determination of feeding methods and rations for calves to reduce mortality and assure growth during the early months of life

is also an important phase of the work.

(f) Studies of Dairy-Herd Improvement Association Records to Determine the Effect of the Application of Breeding and Feeding Practices on Level and Economy of Production.--Under this project are conducted studies and analyses of dairy herd data and dairy farm data obtained in dairy-herd improvement associations and bull associations. Feed and milk production records of nearly one-half million cows on test annually in dairy herd improvement associations are analyzed to show the effect of the application of breeding and feeding practices on the level and economy of production. Data are obtained to enable dairymen to intelligently cull low-producing, unprofitable cows from their herds and adopt better feeding practices.

Analyses of production data are made to indicate the breeding value of every sire used in more than 17,000 herds on test in dairy-herd improvement associations. The genetic make-up of sires is indicated so that inferior sires may be discarded while superior sires may be retained for more extensive use. Complete genetic analysis is made of association herds, to indicate those animals and families of dairy cattle that appear to possess the ability to transmit inheritance for high-producing capacity to their offspring, in order that their influence may be perpetuated and disseminated throughout the dairy-cow population.

Data from bull associations are analyzed to show the advantages of a comprehensive dairy-cattle breeding program, made possible through the cooperative ownership of dairy bulls, and the value of spreading the influence of outstanding sires as widely as possible through such organizations.

The dairy farm as a whole is studied to show the most profitable and practical balance of dairy farm enterprises as well as efficient dairy farm management methods based on actual farm practices in dairy herd-improvement associations.

This work is resulting in the improvement of dairy cattle as evidenced by the fact that the average butterfat production of cows on test in dairy-herd improvement associations is 96 percent above the average production of all milk cows in the United States.

2. Market-Milk Investigations.--Under this project are conducted investigations in sanitary and economical methods of producing, transporting, processing, and distributing market milk and cream to be utilized in fluid form. These investigations include the production and handling of market milk under experimental as well as practical conditions on dairy farms and a study of community milk improvement through milk-control and extension agencies on the area plan. Investigations of the construction, equipment, and efficient operation of milk plants for the processing and preparation for the market of fluid milk and cream are also conducted, as are investigations in the laboratory and at commercial dairy farms and plants to ascertain factors affecting the marketability of milk and cream.

The purposes of the work being conducted are to prevent losses due to souring, spoilage, and other causes; to increase the market value of milk to the farmer, increase consumption of milk, and make rural and urban milk supplies more safe; to effect economies in initial investments and operating costs of

milk plants so as to reduce the spread between producers' and consumers' prices through greater efficiency in plant operation; and to discover undesirable practices which impair the market qualities of milk and cream and devise remedial measures.

The results of these researches enable dairymen to reduce losses through rejected and low-quality milk; extend markets over greater areas; lessen the "spread" between producer and consumer by the introduction of more efficient methods; and increase consumption because of a more acceptable product.

3. Investigations of the Utilization of Milk in the Manufacture of Milk Products.--Nearly one-half of the milk produced in the United States is used in making manufactured products. While the consumption of fluid milk is relatively high, the per capita consumption of manufactured dairy products is much lower than in most other dairy countries. This is due in some measure to the inferior quqlity of much of the domestic product, and this in turn is attributable to ignorance of the fundamental principles involved and to a lack of scientific control of manufacturing methods. Even under good conditions there are losses from abnormal bacterial fermentations and faulty technic.

In addition to the primary products made from milk, enormous quantities of byproducts (skim milk, buttermilk, and whey) are produced. Although the cost of producing the milk solids in these byproducts is nearly as great as the cost of producing the milk fat, adequate methods of converting the solids of these byproducts into human food have been devised to only a limited extent. The object of this project is, therefore, to discover the basic principles involved in handling milk and manufacturing it into various products and by the application of these principles to improve the quality and reduce the cost of manufacture; and to develop the domestic manufacture of certain dairy products now imported from foreign countries and establish these methods in the industry. The work is conducted under the following projects:

(a) Basic Investigations of the Bacteriology and Chemistry of Milk.--The manufacture of all dairy products is based on the control of bacteriological and chemical changes in milk, and the results of studies of these changes provide the basis for all laboratory investigations of an applied nature. Therefore, work on the bacteriology and chemistry of milk is fundamental to practically all investigational work dealing with the manufacture of milk products. Such work was begun by the Bureau of Dairy Industry with an investigation of the numbers and kinds of bacteria surviving pasteurization and the chemical changes produced in milk when it is heated. It has included such work as taxonomic studies of the colon-aerogenes group, the lactobacilli, the bacteria producing alkaline reaction in milk and the proteolytic bacteria of milk, a determination of the hydrogen ion and its relation to the growth of bacteria, and a study of the nature of the lipoid substances. Such studies have frequently led to unforeseen results of great value.

The possibilities of light as a means of controlling reactions, not only of a purely chemical nature but of life processes as well, are just beginning to be realized. In recognition of this fact, work is in progress which will yield important information concerning the action of different kinds of light upon bacteria.

The physico-chemical changes brought about in milk due to bovine mastitis

and the improvement in the methods used in detecting the disease are important when it is considered that from 40 to 60 percent of the milking cows of this country are affected with this disease in one form or another. Investigations are under way to determine the normal sequence of the changes occurring in the milk before and after the onset of the disease and the effect of this abnormal milk when used in the manufacture of cheese.

The identity of the combinations and forms in which many of the chemical constituents of milk exist and the changes which take place in these constituents during manufacturing processes have never been definitely established. Progress in this direction will be of great value in controlling manufacturing processes. Fundamental investigations of these problems are under way.

(b) General Investigations of Ice Cream Manufacture.--Ice-cream making has been developed almost entirely by empirical methods, with little understanding of the physical and chemical principles involved. The rapid development of the industry from small plants operating a single freezer to great factories supplying large districts has introduced many problems in collecting and storing raw materials and the production of a uniform product. The purpose of these investigations, in addition to solving manufacturing difficulties, is to develop methods of manufacture whereby the quantity of milk solids may be increased and the quality of the product improved.

(c) General Investigations of the Manufacture of Butter and Byproducts.--In the manufacture of butter and cheese over 2,500,000,000 pounds of milk solids are produced annually in the form of skim milk, buttermilk, and whey. While only a relatively small part of this is actually wasted, yet from the standpoint of its high food value the most of it is utilized very inefficiently. The more effective utilization of this material by creating new products and improving the quality of the old ones are other phases of the research work being conducted. For example, methods of making casein, used extensively in adhesives and in coating paper, have been perfected and standardized until it is now possible to make a uniform grade especially suited to these purposes. The causes of "foaming", one of the serious defects in making paper-coating solutions, have been determined and remedied.

Methods for the separation of lactalbumin (the soluble protein of milk) from the whey have been developed. The whey, obtained as a byproduct in the manufacture of cheese and casein, contains large quantities of lactose or milk sugar for which there is now only a limited market. The process of separating this sugar has been simplified and an efficient method of converting it into lactic acid has been developed. Further studies are under way to discover methods of converting the lactose or the lactic acid produced by its fermentation into products of value in the arts. New uses for all of these byproducts are being sought.

(d) Condensed, Evaporated, and Dried Milk Investigations.--Three methods for the preservation of milk have been successfully developed commercially. These are the evaporation of milk under vacuum with the addition of sufficient cane sugar to preserve it (condensed milk); evaporation under a vacuum and heat sterilization in the final container (evaporated milk); and reduction to dryness (dried milk). The first method changes the composition of the milk and is falling into disuse. The application of the second is limited because the sterilization gives the milk a cooked flavor which most consumers find objection-

able. The powder obtained by the third method soon acquires an off-flavor through oxidation. If it were possible to prepare a concentrated milk which would keep indefinitely and, on restoration to its original volume, have the flavor and nutritive value of fresh milk, the problem of distribution would be greatly simplified and consumption increased. A process by which bacterial spores may be made more sensitive to heat is being investigated. If such a process can be worked out, the sterilization temperature of evaporated milk may be materially lowered with a consequent disappearance of the cooked flavor of this product.

(e) General Investigations of Cheese Manufacture.--The United States imports over 60,000,000 pounds of cheese annually. To make this quantity of cheese requires the milk from 150,000 average cows. This imported cheese is nearly all of those varieties which command relatively high prices and consequently yield greater returns to the producers of the milk than the ordinary Cheddar cheese.

While the quantity of cheese manufactured in this country is greater than in any other single country, the per capita consumption is lower than in most of the other dairy countries, due partly to the inferior character of the domestic cheese and in some measure to the unattractive packages in which it is marketed. If this country's per capita consumption of cheese was on a par with most European countries, the number of dairy cows would have to be at least doubled in order to supply the necessary amount of milk.

Investigations being conducted by the Bureau of Dairy Industry have for their object the determination of the biological and chemical factors involved in the production of the characteristic flavors and physical properties of various foreign and domestic varieties of cheese. They have for their purpose the improvement of the quality of domestic cheese to provide an additional market for milk by replacing imported cheese with cheese of domestic manufacture.

The manufacture of Swiss and Cheddar cheese from pasteurized milk presents difficulties in developing texture and flavor. These problems are being studied with a view to making pasteurization universal. Work has also been started on some of the milder-flavored, quick-ripening French and Italian cheeses. The ultimate aim of these investigations is to improve the quality of cheese through better milk control, culture control, the standardizing of manufacturing procedures, and careful regulation of the curing conditions, so that the manufacture of all varieties of cheese may be placed upon a more scientific basis. Progress is being made in the direction of modernizing the packaging of cheese.

(f) Factory Investigations for Quality Improvement of Butter, Cheese and Other Milk Products and (g) Introduction into Commercial Factories of New and Improved Methods of Manufacturing Milk Products and Byproducts.--These two work projects have been restated and are superseded by project "h", which follows:

(h) State and Industry Relations for Milk Products Manufacture.--In the research work of the laboratories of the Bureau facts are established which modify existing methods of dairy manufacturing, new processes are established, new products developed, and improved methods of applying scientific control to factory practices worked out. While this new information is published in one form or another, much of it has only potential value until factory operators are convinced by demonstration of its practicability. Since no general organiza-

tion similar to the extension service for working through State officials is available for this type of work, a special organization is essential.

Projects on which the Bureau is now working in cooperation with State organizations include the laboratory control of Swiss cheese manufacture, introduction of the making of cheese of the French Roquefort type and the Italian Bel Paese, the packaging of Cheddar cheese in cans, the manufacture of lactic acid by the fermentation of whey, and the shipment of frozen concentrated milk to subtropical countries.

(i) Inspection of Renovated Butter Factories and of Dairy Products for Export.--The administration of regulatory acts relating to process or renovated butter and to the certification of the purity, quality, and grade of dairy products intended for export is a function of the Bureau conducted under this project. The regulatory duties of this Bureau relating to process or renovated butter have recently been materially broadened through a revision of the administrative regulations of the Bureau of Internal Revenue. Tentative revision of regulations pertaining to all dairy products intended for export has also been made. The enforcement of such regulations at principal ports will prevent the improper or fraudulent labeling of dairy products and thereby insure the exportation of dairy products of a higher quality.

CHANGE IN LANGUAGE

(Passenger-Carrying Vehicles)

The clause following the Bureau total, providing that "not to exceed $5,400 shall be available for the purchase of motor-propelled and horse-drawn passenger-carrying vehicles when necessary in the conduct of field work outside the District of Columbia", has been omitted, since no funds will be required for the purchase of vehicles during the fiscal year 1938.

EMERGENCY FUNDS

Direct Allotments

Projects	Obligated, 1936
Public Works Allotments (National Industrial Recovery Act):	
Physical improvements at Beltsville (Md.) dairy experiment stations (completion of work begun in 1934).....	$3,245
Emergency Relief Appropriation Act of 1935:	
Terracing, fencing, and repairing roads, Lewisburg (Tenn.) dairy station	2,990
Total Emergency Funds (Direct Allotment)	6,235

BUREAU OF PLANT INDUSTRY

(a) SALARIES AND EXPENSES

Limitation on Cost of Buildings

The preamble to "Salaries and Expenses" has been amended so as to raise from $1,500 to $5,000 the limitation as to cost of any building erected under the appropriations of the Bureau of Plant Industry.

In the conduct of investigations bearing on crop problems, extensive investigations located in the field where the problems exist are necessary. Minor construction is frequently necessary as old buildings deteriorate and need to be replaced or as work is expanded. From time to time special small buildings headhouses, barns, etc., are needed for the conduct and completion of specific investigational problems. Such specially constructed experimental buildings often can not be erected within the $1,500 limit which now obtains. Examples of such buildings are as follows:

When greenhouses are constructed or are available for conducting pathological, physiological, and breeding investigations, necessary requisites are attached headhouses, where soils, fertilizers, pots, and labels can be stored and where provisions may be available for potting and sampling plants. At the present time no headhouses are available for four greenhouses constructed during the past two years. This is resulting in less efficient use of the greenhouses and a greater cost of the experimental work.

In the fruit and vegetable plot experiments, comprising a large number of acres, it is often necessary to secure detailed records of several hundred bushels of products. Facilities should be provided, in the nature of a small packing house, where such experimental crops can be graded, sized, weighed, studied, and finally packed for storage or transportation investigations. Such experimental facilities might cost $3,000, $4,000, or more. As the investigations develop at a field station, it may be desirable to erect a small machinery shed for farm implements, tractors, trucks, etc., which might cost $3,000 to $4,000.

The above examples show the type of buildings which are necessary from time to time in the conduct of the investigations of the Bureau of Plant Industry and which are as much a part of the needed equipment for research as microscopes, drying ovens, greenhouses, sterilizing equipment, etc. Portions or parts of such facilities could be erected from year to year out of research funds in the same way that scientific equipment is gradually secured if the limitation on total cost were eliminated.

(b) GENERAL ADMINISTRATIVE EXPENSES

Appropriation Act, 1937	$189,242
Budget Estimate, 1938	189,242

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)
1. General administration and business service	$188,951	$189,242	$189,242
Unobligated balance	291	- -	- -
Total appropriation	189,242	189,242	189,242

WORK UNDER THIS APPROPRIATION

The direction of the research, service, and regulatory work of the Bureau of Plant Industry, administration of fiscal affairs, general supervision of personnel, and administrative review and preparation of research and other publications and bibliographical and related library work, as well as the partial financing of such service activities as the photographic laboratory, are carried on under this appropriation.

(c) ARLINGTON FARM

Appropriation Act, 1937	$49,414
Budget Estimate, 1938	49,414

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)
1. Arlington Farm -- maintenance of facilities for basic plant research	$48,033	$49,414	$49,414
Unobligated balance	1,381	- -	- -
Total appropriation.	49,414	49,414	49,414

CHANGE IN LANGUAGE

If the limitation on building cost, contained in the introductory clause to "Salaries and Expenses", is raised from $1,500 to $5,000, as recommended in these estimates, the proviso under Arlington Farm "That the limitations in this Act as to the cost of farm buildings shall not apply to this paragraph" could be eliminated. Otherwise, the language would need to continue unchanged.

WORK UNDER THIS APPROPRIATION

A highly improved 400-acre tract is maintained in Virginia, near Washington, D. C., provided with specially equipped laboratories, greenhouses, barns, shops, and other buildings to furnish facilities for conducting experiments and practical farm tests covering a wide range of research work, national in scope, principally for the Bureau of Plant Industry, but also available for the Bureaus of Chemistry and Soils, Public Roads, Entomology and Plant Quarantine, and Agricultural Engineering, the Soil Conservation Service, and other branches. By furnishing similar facilities common to the many activities from a central station, duplication of effort and equipment is avoided and the cost of operation appreciably reduced. This item provides funds for the general maintenance of the plant and farm facilities. The work of other divisions in the Bureau and of other bureaus and departments is conducted at cost on a reimbursement basis.

(d) BOTANY

Appropriation Act, 1937	$76,635
Budget Estimate, 1938	76,635

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)
1. Botanical investigations	$36,622	$36,635	$36,635
2. Weed control investigations	39,950	40,000	40,000
Unobligated balance	63	- -	- -
Total appropriation	76,635	76,635	76,635

WORK UNDER THIS APPROPRIATION

General.--The work under this appropriation consists of the identification of wild and cultivated plants; special systematic studies of grasses that serve as a basis for forage, range, and erosion collection work; and the domestication and improvement of wild plants, particularly the blueberry. Botanical studies conducted under this project serve as a starting point for numerous investigations made by the various branches of the Bureau of Plant Industry and other bureaus of the Department. With the increased demands

made upon this project by the Forest Service and the erosion-control agencies and the inevitable increase of duties resulting from development of the National Arboretum, work under this project has become of major importance. The studies and identifications under this project are essential to the development of accurate and dependable plans for future work.

1. Botanical Investigations.--Work on economic botany consists chiefly of studies and identifications of plants other than grasses for various bureaus of the Department. Assistance is also given to agricultural experiment stations, farmers, nurserymen, and other individuals and organizations. Information derived from this work is of primary importance in grazing and erosion work, investigations of plants poisonous to stock, forage experiments, and other lines of work. Correct botanical identification is of primary importance for all breeding projects involving cultivated plants and their wild relatives. Accurate and dependable studies and identifications are essential as a basis for investigations if reliable results are to be obtained.

Work on grass investigations includes systematic studies of both domestic and foreign grasses which serve as a basis for important grass investigations from the forage and erosion standpoint. The collection of grass specimens maintained is the largest and most valuable reference collection in the world. The botanical studies conducted and publications built up as a result of these studies comprise a reference collection of information which is the basis of all important grass investigations of the Department. With the increased importance of forage and soil-erosion projects, this work has become an important factor in the conduct of the investigations. Adequate and accurate reference is essential as a starting point for our grass projects.

The principal work on blueberry investigations has been the breeding of new varieties of blueberries earlier and later than those now in use, or of still better flavor and other desirable commercial qualities, or adapted to a latitude and climate farther south than existing varieties. The wide interest in blueberry culture has developed a rather extensive correspondence on the subject. The blueberry investigations have resulted in the domestication and improvement of the wild blueberry; in the addition of a luscious and healthful fruit to the dietary of city dwellers; in the establishment of a thriving and growing new industry of blueberry culture; and in the utilization of areas of special, strongly acid soils not adapted to other agricultural uses.

A similar project is conducted in breeding American varieties of gooseberries, using native species in themselves suited to our conditions but now of inferior quality.

2. Weed Control Investigations.--The work under this project is intended to provide information with respect to the most effective and least expensive methods of controlling or eradicating field bindweed, or European morning glory, and other noxious weeds. Investigations were inaugurated at the Fort Hays Experiment Station, Hays, Kansas, July 1, 1935, in cooperation with the Kansas Agricultural Experiment Station. Similar work has been undertaken since that date in cooperation with State experiment stations in Iowa, Minnesota, Nebraska, Colorado, California, and Idaho.

The justification for these investigations lies in the very wide dissemination of bindweed in past years and the very great difficulty encountered by farmers in eradicating it. Farms otherwise productive have been abandoned because of bindweed infestation, and in several States the pest is considered so serious that loans can not be secured on infested farms. It is very difficult to eradicate bindweed entirely once it becomes firmly established. It is believed that research with chemical treatments and with cultivating and cropping methods such as are contemplated under this project will indicate feasible and economical methods of control. Funds for studies and development of chemical means for combating the bindweed and other obnoxious weeds are carried in the appropriation "Agricultural Chemical Investigations", Bureau of Chemistry and Soils.

(e) CEREAL CROPS AND DISEASES

Appropriation Act, 1937	$520,721
Budget Estimate, 1938	526,721
Increase	6,000

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)	Increase
1. Barley investigations	$55,752	$55,855	$55,855	- -
2. Corn investigations	134,092	136,505	136,505	- -
3. Seed flax investigations	16,710	15,145	15,145	- -
4. Sorghum investigations	28,232	26,098	26,098	- -
5. Oat investigations	43,739	43,875	43,875	- -
6. Rice investigations	43,923	44,155	44,155	- -
7. Wheat investigations (b)	181,372	199,088	205,088	+$6,000 (1)
Unobligated balance	1,901	- -	- -	- -
Total appropriation	505,721(a)	520,721	526,721	+ 6,000 (1)

(a) For 1936 includes $3,798 transferred from "Forage Crops and Diseases" for sorghum investigations.
(b) Also Emmer, Spelt, etc. and Rye.

INCREASE

(1) An increase of $6,000 for investigations in the variety improvement of eastern wheats. The funds now available for soft wheat quality studies in the eastern soft winter-wheat area is sufficient only to care for the quality laboratory itself. If the studies are to be most effective they should be correlated with an improvement program. The present facilities of the Division in the area involved will not permit this to be done with the greatest efficiency. The additional amount here requested will allow for coordinating the work of the various State agricultural experiment stations now under way, will make it possible to provide materials that can not be available otherwise, and, in general, will insure greater effectiveness of expenditure.

WORK UNDER THIS APPROPRIATION

General.--This work includes studies of cultural practices with cereal crops and the investigation of their possible improvement; comparison of the yield and adaptability of different varieties to different regions and of their quality for different uses, together with the breeding and selection of improved and better-adapted varieties; and the development of methods of controlling the diseases of all cereal crops, including the breeding of disease-resistant varieties. Cooperative experiments are carried on at most of the State agricultural experiment stations but no independent field stations are maintained.

The justification for this work lies in the importance of the cereal crops to the agriculture of the United States. Cereal crops not only supply directly an important part of the dietary requirements of the people, but as feed for livestock are the basis of our livestock and dairy industries as well. During the period from 1927 to 1931, inclusive, cereal crops occupied more than 225,000,000 acres each year, and even with the reduced acreages of 1934 and thereafter they now occupy some 190,000,000 acres. Corn, the principal cereal crop, is the most important single crop of the country, in 1934 being grown on 92,500,000 acres. It is the backbone of American agriculture. On the basis of either unlimited or controlled production, increased efficiency and reduced costs are necessary for the profitable production of cereal crops and the consequent well-being of our agricultural population. Increased efficiency and reduced costs can only be attained through improvement in practices and varieties which will reduce the hazards incident to disease, reduced fertility, and, insofar as possible, the action of cold and drought. Without the improved varieties even now available, the results of the disastrous drought during the season of 1934 would have been even more marked. The trained personnel engaged in this work also constitute an effective safeguard for the future welfare of the country. During the drought emergency the existence of this effective going organization made possible the location and conservation of adapted seed stocks for succeeding crops that otherwise were in serious danger of being lost.

1. Barley Investigations.--During the five years ending with 1931 barley was grown on approximately 12,000,000 acres annually. It has become increasingly important in recent years as a feed grain, and with the return of commercial brewing there is again available an important special market for malting barley. Quality is a most important factor in determining price, high quality carrying a substantial market premium. The control of diseases and the improvement of varieties to insure quality is imperative in order to meet market needs and to insure profitable production.

2. Corn Investigations.--Corn is the most important single crop grown in this country. It is the foundation of American agriculture. It normally occupies approximately 100,000,000 acres annually, and even with reduced acreage in 1934 there were 92,500,000 acres. Higher-yielding, better quality strains are needed to eliminate preventable hazards and to reduce production costs and losses in commercial channels. Disease control also is badly needed to prevent stand reduction in seedling corn and reduced quality in harvested grain. Special types for certain technical uses also should be developed.

3. Seed Flax Investigations (Also Buckwheat).--Seed-flax production is not extensive but in the areas where the crop is grown it is most important. During the five years 1927 to 1931 the average harvest was 2,915,000

acres. The amount produced is less than domestic consumption, and there is opportunity for profitable increase in the present acreage. The production of this crop is entirely dependent on disease-resistant varieties; and in emphasizing this factor oil yield and quality heretofore have not been given necessary attention. There is definite need for improved varieties combining disease resistance with seed yield, oil yield, and oil quality.

4. Sorghum Investigations (Also Broomcorn, Proso, Millets, etc.).--Sorghums are normally grown on some 7,000,000 acres annually. The acreage is increasing. The crop is the standard feed and forage reliance of the entire south-central United States, where drought- and heat-resistant summer crops are essential. Certain special types that can be harvested to advantage with machinery used for other grain crops have been developed, but more are needed to cover the entire sorghum growing area. Disease resistance to reduce preventable losses also is needed. Broomcorn varieties producing better quality brush and less affected in quality by weather conditions are also badly needed.

5. Oat Investigations.--Oats are the most important small grain feed crop of the country. It is also most important as a rotation crop for use in seeding clover and grasses throughout the country. In normal times some 40,000,000 acres of the crop are grown annually, and in 1934, with reduced acreage, 33,348,000 acres were harvested. The quality of the crop is often seriously reduced by heat and drought and by diseases, and while progress has been made in developing better varieties much remains to be done.

6. Rice Investigations.--Rice is a specialized crop grown on a limited acreage so far as the country as a whole is concerned (750,000 to 950,000 acres annually), but where grown in Arkansas, Louisiana, Texas, and California it is the basis of agriculture and represents a large and specialized investment. Lands used for this crop also are less suited for other types of cropping. The peculiar conditions under which the crop is grown, requiring constant flooding of the land, introduce many problems in soil fertility, pests, diseases, and special considerations of culture and rotation that require solution. Varieties of better culinary value, also, are needed to increase market demands.

7. Wheat Investigations (Also Emmer, Spelt, etc., and Rye).--Wheat is the staple food crop of the country, is the basis of agriculture in a large and important area, supports an extensive manufacturing and processing industry, and is a most important export product. Profits in wheat production are dependent on reducing hazards from cold, drought, disease, and poorly adapted varieties and on the development of cultural and rotation practices that will reduce expense and at the same time stabilize production. Much has been accomplished along these lines, but much still remains to be done to obtain desirable types for all areas.

(f) COTTON AND OTHER FIBER CROPS AND DISEASES

Appropriation Act, 1937	$406,435
Budget Estimate, 1938	406,435

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)
1. Cotton investigations (production, improvement, and diseases):			
(a) General cotton breeding and improvement investigations.	$103,745	$103,945	$103,945
(b) Egyptian cotton breeding and improvement investigations.	22,233	22,253	22,253
(c) Sea Island cotton breeding and improvement investigations.	14,698	15,000	15,000
(d) Cotton genetic investigations.	53,900	54,000	54,000
(e) Studies of the structure and growth of the cotton plant and of cotton fibers	9,286	9,300	9,300
(f) Cotton plant nutrition and other physiological investigations	65,870	66,000	66,000
(g) Cotton disease investigations	27,950	28,000	28,000
(h) Cotton quality research from the standpoint of production	39,920	40,000	40,000
(i) Cotton culture investigations	9,185	9,200	9,200
(j) Investigations on establishing improved cotton seed stocks, including one-variety community methods.	39,920	40,000	40,000
Total, Cotton investigations (production, improvement, and diseases).	386,707	387,698	387,698
2. Fiber plants other than cotton, investigations of:			
(a) Hard fiber studies.	8,086	8,200	8,200
(b) Fiber flax agronomic and breeding investigations. .	4,800	4,800	4,800
(c) Hemp investigations	5,627	5,737	5,737
Total, Fiber plants other than cotton	18,513	18,737	18,737
Unobligated balance	1,215	- -	- -
Total appropriation	406,435	406,435	406,435

CHANGES IN LANGUAGE

Two changes in language are proposed in this paragraph, as follows:

(1) Instead of the clause, following the appropriation figure, "of which sum not exceeding $15,000 shall be used for experimenting in Sea Island cotton, including its hybridization with other varieties", the words "including Sea Island cotton" have been inserted, so that the amount which may be used for Sea Island cotton investigations will be left to the discretion of the Department. As the proviso now stands, the Department is required to expend for studies on this crop far more than is believed to be reasonably necessary. It is planned to continue the investigations of Sea Island cotton as a part of the general cotton breeding and improvement program, but the removal of the proviso requiring the spending of a specific amount for the work is recommended in the interest of more effective use of the money appropriated.

(2) A new proviso has been added to the end of this paragraph reading:

"Provided, That the Secretary of Agriculture is authorized to acquire, by gift, devise, or by purchase in fee simple for a sum not to exceed one dollar, a tract of land containing approximately 15 acres, now a part of the cotton field station near Greenville, Texas."

Since 1918 the Bureau of Plant Industry has maintained a field station at Greenville, Texas, known as the United States Cotton Field Station, comprising a tract of land of some 100 acres made available to the Bureau by the Greenville Chamber of Agriculture, Industry, and Commerce at a nominal rental of $1.00 per annum under a contract renewable to the year 2017. The Bureau of Plant Industry has erected temporary buildings and other improvements on an area of approximately 14 1/2 acres at this station. The Greenville Chamber now offers to deed to the Department the 14 1/2-acre tract on which the buildings are located. Acceptance of this land will involve no cost to the Government.

The Greenville station is the headquarters of our cotton investigations in that general section of the cotton belt. The keen interest and excellent cooperation of the local farmers have contributed to really effective work, and some of our most important cotton research is now under way at this place. The assurance of being able to continue the experiments at the same place over a period of years enhances the value of the location, and the work here also has application to areas of similar soil and climatic conditions in nearby regions in Texas and adjacent States.

The Department believes it is clearly to its advantage to have title to the land in the building area, as this will permit better administration of the improvement program and give greater freedom in providing the type of equipment and buildings needed. In view of the importance of the Greenville station to our cotton improvement program, it is hoped that advantage may be taken of the offer of the Greenville Chamber of Agriculture, Industry, and Commerce to deed this land to us without cost.

WORK UNDER THIS APPROPRIATION

General.--The work done under this appropriation consists of the investigation of cultural practices for growing cotton; the breeding of superior varieties of cotton, including Egyptian and Sea Island; study of the effect of soil, climate, and other factors on the yield, quality, and values of cotton fiber; study of chemical, physical, and other properties of cotton fibers which determine values for specified uses, and the measurement of probable values by means of these properties; investigation of cotton diseases and their control, including breeding for disease resistance; utilization and maintenance of superior strains of cotton through the organization of single-variety communities; and investigations of hemp and flax fiber production and of hard fibers and other fibers used for ropes, twines, etc. This work is conducted in cooperation with the Bureaus of Agricultural Economics, Agricultural Engineering, Entomology and Plant Quarantine, and Chemistry and Soils, with the State agricultural experiment stations and extension services, and with certain counties and group organizations.

1. Cotton Investigations.--The work under this project consists of breeding operations to develop strains and types of cotton superior in yield and in lint character and resistant to climatic and other factors reducing yield and quality. It also includes studies of the relation of climatic and other factors to fiber yield and quality and of means of measuring quality factors so that new cottons being developed may be tested for quality before distribution. It likewise includes studies on cotton diseases and their control and of all other factors having to do with growing satisfactory yields of high-quality cotton.

Cotton is the bread-and-butter cash crop of the entire cotton-producing area. The crop also is of primary importance in domestic commerce and manufacture, six million 500-pound bales (in round numbers) being the normal domestic consumption, and is the country's principal agricultural export product. The 1936 crop occupies about 30,000,000 acres and in the past has totaled in excess of 40,000,000 acres. The 1935 cotton crop, including the value of the lint and seed, was worth in excess of $750,000,000. Intensive research on cotton is justified by its importance in the livelihood of such a large part of our population; by the necessity of improving and maintaining the improvement of American cotton in order to hold the export market in the face of the aggressive competition from high-quality foreign production; and by the necessity for stabilizing production and for reducing production costs through removal of hazards caused by low quality, poor producing strains, diseases, faulty cultural practices, etc.

2. Fiber Plants Other Than Cotton.--Work under this project includes the investigation of hemp and flax fiber production in the United States and of hard fibers such as abaca (Manila hemp), maguey, sisal, and henequen in the tropics; and all plant fibers, except cotton, used for ropes, twines, yarns, woven fabrics, hats, matting, and stuffing or filling.

Flax fiber production is now established as a profitable crop in Oregon, and experiments of the past two years indicate that this industry may be revived in certain areas in the East. An increase of more than 500 percent in the hemp acreage in this country shows increased interest in this crop. There is need for continued plant breeding of both fiber flax and hemp and further

experimental work with relation to soil types and agronomic practices in growing these crops and preparing the fibers. Hard fibers, produced only in the tropics, are necessary for bindertwine and all high grade cordage. It is important that coordination be kept up between twine and cordage manufacturers in this country and fiber producers in the tropics and that standards of fiber quality be maintained.

(g) DRUGS AND RELATED PLANTS

Appropriation Act, 1937	$47,139
Budget Estimate, 1938	47,139

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)
1. Drug, poisonous, insecticide, oil, and related plant investigations	$34,093	$36,279	$36,279
2. Hop production and disease investigations.	8,938	10,860	10,860
Unobligated balance	4,108	- -	- -
Total appropriation. . . .	47,139	47,139	47,139

WORK UNDER THIS APPROPRIATION

General.--The work under this appropriation consists of investigations of plants yielding drugs, poisons, insecticides, essential oils, drying oils, and perfumes with respect to their culture, their constituents and their possibilities as crops in the United States; also studies on hop production with particular reference to the improvement of the quality of domestic hops and to the control of the downy mildew through field practices and the development of new resistant varieties.

1. Drug, Poisonous, Insecticide, Oil, and Related Plant Investigations.--Plants that are important sources of products used in the manufacture of medicines, pharmaceuticals, flavoring materials, perfumes, insecticides, paints and varnishes, and related commodities are grown experimentally to determine their cultural requirements, the proper methods of handling, the methods of obtaining the commercial products from them, their qualities under various conditions, and the cost of production as a basis for their introduction into American agriculture.

This country is dependent upon foreign countries for most of these products. In some cases such sources are not available during extensive world disturbances. Their domestic production insures a more steady supply and

better quality for the consuming industries, and the growing of the plants producing them provides noncompetitive cash crops for farmers to turn to in favorable localities during periods of staple crop surpluses. In view of the fact that farmers are entirely unacquainted with the special requirements of such plants, much information must be obtained by preliminary investigations to provide the necessary background for their commercial introduction. This is primarily the objective of this project.

2. Hop Production and Disease Investigations.--Under this project hop growers are assisted along two lines; (a) The relationship of various production factors to the brewing qualities of hops are studied as a means of bringing about a general improvement in the quality and uniformity of domestic hops, and (b) growers are advised regarding cultural practices that reduce the spread of downy mildew and other diseases and instructed in the use of fungicide sprays and dusts to control the losses while a more permanent solution is sought through the development of new varieties with good commercial qualities and resistant to the disease.

The brewing industry is dependent almost entirely on the Pacific Coast States for its supply of hops. A permanent improvement in the uniformity and quality of the crop would enable growers to meet to a greater degree the competition with foreign hops. Unless the downy mildew is effectively controlled or resistant varieties provided, hop growing may have to be abandoned in many localities where it is now an important industry. Aside from the economic loss suffered by the established growers, the resultant shortage would necessitate more extensive use of the more expensive foreign hops, with a corresponding increase in the cost of brewing.

(h) DRY-LAND AGRICULTURE

Appropriation Act, 1937	$215,578
Budget Estimate, 1938	175,000
Decrease	40,578

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)	Decrease
Dry-land agriculture investigations:				
(a) Dry-land field crop production investigations	$160,094	$163,612	$123,034	- $40,578(1)
(b) Dry-land fruit and vegetable production investigations	26,624	28,277	28,277	- -
(c) Cooperative shelterbelt demonstration and experimental test plantings	26,985	23,689	23,689	- -
Unobligated balance	1,895	- -	- -	- -
Total appropriation . . .	215,578	215,578	175,000	- 40,578(1)

DECREASE

(1) The reduction of $40,578 made in this item will necessitate discontinuance of (a) the dry-land agriculture station at Lawton, Oklahoma, (b) the dry-land agriculture projects at the Huntley, Montana station maintained and operated by the Division of Western Irrigation Agriculture, and (c) the cooperative activities of the Division of Dry Land Agriculture at the State experiment stations located at Pendleton, Oreg., Garden City and Colby, Kans., Dickinson, N. Dak., Moccasin, Mont., and Archer, Wyo.

WORK UNDER THIS APPROPRIATION

General.--Under this appropriation the problems of agricultural and horticultural development of the Great Plains and intermountain areas, a region classed as semi-arid, are studied at field stations to obtain the fullest possible information concerning soil and climatic conditions throughout the region and the agricultural effectiveness of each of the many different methods of tillage and crop rotations that can be considered as more or less suitable for this region where irrigation is not available.

Field stations are maintained at Akron, Colo., Tucumcari, N. Mex., Mandan, N. Dak., Lawton, Okla., Woodward, Okla., Big Spring, Tex., Dalhart, Tex., and Sheridan, Wyo.

Investigations also are conducted at stations maintained by the Division of Western Irrigation Agriculture, Bureau of Plant Industry, at Huntley, Montana, and Newell, South Dakota.

Investigations also are conducted in cooperation with States at State stations located at Colby, Kans., Garden City, Kans., Moccasin, Mont., Dickinson, N. Dak., Archer, Wyo., Hays, Kans., Havre, Mont., North Platte, Nebr., and Pendleton, Oreg.

Dry-land agriculture investigations are conducted under three main activities, as follows:

(a) Dry-Land Field Crop Production Investigations.--The work under this project consists of rotation and tillage experiments with cereal crops, forage crops, and cotton, as well as studies of pasture conservation and development, under dry-land conditions in the Great Plains area. (The Bureau of Animal Industry cooperates with livestock experiments at Big Spring, Texas). Crop rotation, cultural methods, and pasture practices are concerned not only with the immediate effects, but with the cumulative effects, in increasing, maintaining, or decreasing the productivity of the soil.

(b) Dry-Land Fruit and Vegetable Production Investigations.--The work under this project consists of demonstrations of the feasibility of growing in this semi-arid region certain fruits and vegetables which can be produced on a home-garden scale.

(c) Cooperative Shelterbelt Demonstrations and Experimental Test Plantings.--Under this project trees and ornamental plants that can be grown in dry regions are propagated and placed with experimenters for testing, and

demonstrations of trees planted as shelterbelts are developed and encouraged. The dry lands naturally are treeless regions, but gratifying success has attended systematic effort to determine the kinds of trees and methods of care and culture necessary to their successful growth for shade and shelter.

(i) EXPERIMENTAL GREENHOUSE MAINTENANCE

Appropriation Act, 1937	$78,632
Budget Estimate, 1938	78,632

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)
Maintenance and operation of experimental greenhouses and adjacent experimental grounds and plots	$78,188	$78,632	$78,632
Unobligated balance	444	- -	- -
Total appropriation	78,632	78,632	78,632

WORK UNDER THIS APPROPRIATION

A range of thirty-two greenhouses, supplemented by a small adjacent outdoor area, is maintained, providing for experimental work with a wide range of plants. The greenhouses are operated to furnish necessary experimental facilities to the several appropriation items, particularly those dealing with the diseases of plants caused by bacteria, fungi, or nemas. Maintenance of experimental plants for hybridization or other plant-breeding or plant-physiological studies are also provided for.

(j) FORAGE CROPS AND DISEASES

Appropriation Act, 1937	$300,193
Budget Estimate, 1938	300,193

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)
1. Alfalfa investigations.	$48,986	$59,000	$59,000
2. Clover investigations	29,018	29,048	29,048
3. Soybean and cowpea investigations	19,496	19,500	19,500
4. Lespedeza and other acid-tolerant legume investigations.... . .	39,955	40,000	40,000
5. Grass and pasture investigations	152,393	152,645	152,645
Unobligated balance	345	- -	- -
Total appropriation	290,193(a)	300,193	300,193

(a) For 1936 includes $3,645 transferred from "Experiments in Livestock Production in Southern United States" (Miscellaneous), and excludes $3,798 transferred to Cereal Crops and Diseases for sorghum investigations.

CHANGES IN LANGUAGE

It is recommended that the language of this appropriation be changed in order to describe more clearly the investigations conducted thereunder. In 1927, the funds for the distribution of new and rare seeds were eliminated, but the wording of the item has, through inadvertence, continued unchanged. The item as revised will read:

> For the [purchase, propagation, testing, and distribution of new and rare seeds; for the] investigation and improvement of <u>forage crops, including</u> grasses, [alfalfa, clover, and other forage crops; including the investigation and control of diseases] <u>alfalfas, clovers, soybeans, lespedezas, vetches, cowpeas, field peas, and miscellaneous legumes, for the investigation of green-manure crops and cover crops; for investigations looking to the improvement of pastures; and for the investigation of forage-crop diseases and methods of control,</u> $300,193.

<u>General</u>.--Research under this appropriation includes studies in the production and improvement of plants used for hay and pasturage and in lawns, parks, airports, and fine turfs; the control of diseases of these plants; determination of their relative hay, pasture, and turf values, their habits of growth, mode of inheritance, seeding habits, and the possibility of their economic utilization. These studies are made under the following projects:

1. <u>Alfalfa Investigations</u>.--The purpose of this project is to study existing species and varieties of alfalfa which have been assembled from both foreign and domestic sources, with a view to selecting and breeding varieties specially suited to various soil and climatic conditions; study the diseases of alfalfa and effective control measures, through breeding or otherwise; and improve cultural practices as a means of rendering production as stable and profitable as possible. Species, varieties, and regional strains of alfalfa from

common sources of seed are compared in a number of different regions throughout the United States. Relative winter hardiness and disease resistance are determined, hay and seed values measured, and factors influencing seed-setting studied. Breeding is employed to effect improvement in hay and seed production, as well as resistance to cold and disease. Cultural studies are undertaken to solve problems arising from specific conditions. Drought, cold, disease, and other factors which periodically limit alfalfa production in various parts of the United States may be met most effectively through the use of improved farm practice, improved varieties, and methods of culture specially adapted to specific soil and climatic requirements. Hardiness in alfalfa is sought by all growers, and the results of current research indicate the possibility of making available varieties and strains possessing unusual hardiness as measured by relative resistance to cold and disease, particularly bacterial wilt--a disease which reduces the life of alfalfa from ten to three years and necessitates special cultural practices.

2. Clover Investigations.--The object of this project is to study causes of clover failure; introduce into agricultural use new species and varieties; and study the diseases of clover, cultural factors, and the possibility of breeding improved varieties. The work involves the testing of all available species, varieties, and regional strains at different field stations under widely varying environments; maintenance of nurseries of red, sweet, and other clovers for observation and as sources of breeding material; and cultural experiments, disease studies, and development of breeding technique to secure varieties resistant to disease and winter-killing. Clovers constitute the basis of good crop-rotation systems in most of the important agricultural areas of the United States. In these areas their culture is fundamental in soil conservation and livestock production. The frequent failures of red clover and cultural difficulties with sweet clover make it necessary to continue the study of factors controlling the successful production of these important crops. The problem of retaining white and other clovers in pasture mixtures with grasses is of particular importance at this time and is commanding widespread attention. Strains of red clover far superior to common strains have been isolated, and their perfection and establishment in farm practice would reduce losses now incurred by farmers through clover failures. Comp arable progress is being made with sweet clover in the Western States and with white clovers in the Northeastern States.

3. Soybean and Cowpea Investigations.--This project aims to improve varieties of soybeans being successfully grown in the United States and to find improved varieties for regions now lacking suitable varieties for forage, green manure, pasturage, and seed in the oil and food industries, with special attention to oil and protein content, nutritive value, grain yield, and quality of beans; to develop better varieties of cowpeas, especially of disease-resistant types, suitable for food, forage, and soil-improvement purposes; to test numerous introductions and selections in various parts of the United States, in cooperation with Federal and State experiment stations; to study adaptations of soybean varieties and selections and compare their values for forage, food, and industrial purposes; and to study cowpea varieties from the standpoint of forage and seed types and their resistance to wilt and nematode injury. A tenfold increase in the total production of soybeans in the United States between 1925 and 1935 brought this crop to a position of major importance industrially as well as agriculturally. Its use as a forage plant will continue and probably greatly extend, and with the rapid development of the soybean oil and food industries a considerably increased acreage for seed production may be expected.

There are more than 50 oil mills and food factories in the United States which have a crushing capacity of 20,000,000 bushels of soybeans annually. The seed crop alone in 1935 was valued at $34,000,000, and this is estimated as representing about one-fourth of the total value of the soybean crop in that year. Soybeans are very susceptible to soil and climatic influence, and there is need for continued research to satisfy both agricultural and industrial demands for superior varieties.

Similar studies are being made with cowpeas, which will continue to be one of the most important leguminous crops in the Southern States. The cowpea seed crop of 1934 totaled 5,296,000 bushels, with a value of $13,000,000.

Lespedeza and Other Acid-Tolerant Legume Investigations.--The object of this work is to determine the best species and varieties of vetches and other winter legumes and of Lespedezas and Crotalarias, leading summer cover crops; to study cultural problems and methods of utilization in soil conservation, forage, and other uses; to select improved varieties, study seed-supply problems, and try to develop disease-control measures; to test seed of all available species and varieties at appropriate field stations, and determine the best methods of production and utilization. By far the greatest part of the land south of the Ohio and Potomac Rivers and from the Atlantic Ocean to the Ozarks consists of acid soils. On these soils alfalfa and clover can not be grown without excessive liming, at prohibitive cost. The need for finding acid-tolerant crops which will grow on these soils and thereby aid in soil conservation, and at the same time furnish forage, is imperative. The Bureau of Plant Industry already has introduced one Lespedeza so well suited to soil and climatic conditions in the region described that in ten years the acreage has increased from nothing to 7,000,000 acres. Continued shifts in agriculture, calling for summer pasturage, will result in extended use of these crops. In the meantime, some winter-acid-tolerant legumes, as Austrian peas, are being limited by disease, and the problem of developing varieties resistant to disease has arisen to demand active interest on the part of plant breeders and pathologists.

Grass and Pasture Investigations.--This project includes the test of introduced and native species and the selection and breeding of superior varieties and regional strains for use as hay or pasturage or in fine turfs; study of the reaction of grasses to various environmental factors and different intensities of use; study of growth and fruiting habits or life history of grasses as a means of insuring full utilization and adequate seed production; development of disease control measures; comparison of species and varieties under field conditions in various parts of United States; selection of superior strains of different types and their study with reference to productiveness, nutritive value, and seeding habits; further improvement through hybridization; development of methods designed to insure seed supplies of the more promising strains; and cultural tests to determine suitable methods of seeding and establishing turfs and of maintaining them under use, free from weeds and diseases. Over one-half of the total land area of the United States is utilized in some degree as pasturage. Grasses are the foundation of practically all pasture flora and, in addition, they contribute over one-third of the hay produced in the United States. Their high value as soil cover in soil-erosion control is generally recognized, as is their importance in lawns and fine turfs for ornamental and recreational use or for the protection and beautification of highways and railroad right-of-ways. Major adjustments in agricultural practice in the interest

of soil conservation and for other reasons are calling for still wider use of grasses, and it is likely that an urgent demand for information pertaining to them will persist indefinitely. Yet, with no other forage plants is there a greater lack of definite information on species, varieties, possibility of improvement, and use. The greatest possible use of grasses will not be realized until knowledge concerning these important forage plants is increased to a point where it will be as intimate and comprehensive as present knowledge of corn and other cereals.

(k) FOREST PATHOLOGY

Appropriation Act, 1937	$252,092
Budget Estimate, 1938	252,092

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)
1. Diseases of forest trees and forest products, investigations of	$127,000	$127,357	$127,357
2. Diseases of shade trees, shrubs, and chestnut orchards, investigations of	51,460	51,716	51,716
3. Epidemic tree diseases, investigations of	72,925	73,019	73,019
Unobligated balance	707	- -	- -
Total appropriation	252,092	252,092	252,092

WORK UNDER THIS APPROPRIATION

General.--Under this appropriation investigations are conducted on the diseases of forest trees, shade trees, and shrubs, with particular reference to control methods; also studies on the decay and discoloration of logs, lumber, pulpwood, posts, and other forest products. The same organisms frequently cause diseases of both forest and shade trees, and some of the fungi found in structural timber may also cause losses in standing trees. The National Government, in its Forest and Park Services, directly controls large forest areas; hence these investigations are of direct service to the Government in the administration of its own properties in addition to their value to private wood producers and wood users. The State agricultural experiment stations are paying relatively little attention to forest and shade-tree diseases. The extensive development in forestry during recent years, including such activities as the soil-erosion work, enlargement of national forests in the East, State and Government civilian conservation camp work, and the Tennessee Valley development, have all placed increasing demands on the services of the pathologist of this Division.

Tree-disease work, in cooperation with the U. S. Forest Service and in some cases with State agencies, is conducted at the following points: San

Francisco, Calif.; New Haven, Conn.; New Orleans, La.; Albuquerque, N. Mex.; Portland, Oregon; Philadelphia, Pa.; and Madison, Wis. Work on the Dutch elm disease is conducted at the cooperative field stations at Morristown, N. J., and Wooster, Ohio. The major portion of the shade-tree work is centered at New Haven, Conn., though each of the other branch offices does some work on this general problem with particular reference to the surrounding region.

1. Diseases of Forest Trees and Forest Products.--Work under this project, carried on mainly at the experiment stations of the Forest Service, consists of investigations of the native diseases attacking forest nursery stock, plantations, and standing trees in the forest, as well as the fungous discolorations and decays of logs, lumber, etc., and is part of the program authorized by the McNary-McSweeney Act. Research on the long-introduced diseases, chestnut blight and white-pine blister rust, is also included, forming a basis for the development of resistant forest chestnuts and for the local control of the rust.

The management of Government, State, and private forests on a profitable basis depends upon the prevention of loss from disease and decay. Nursery diseases must be controlled, both for economical production of planting stock and to insure healthy trees for starting field plantations. Because of the long life of forest trees, study of their diseases must be continuous over a period of years. A new method of approach to forest production has been developed which considers the effect of diseases on the stand and the timber yield rather than on the individual tree and aims at preventing losses from native diseases through changes in the methods of forest management rather than by individual tree treatment. Investigations of fungous injury to forest products are under way, including a campaign against sap stain, for which the Southern lumbermen have been furnishing part of the funds, as well as of other problems to meet the demands for information by various groups of wood producers and consumers. The improved control methods developed in this work have already come into large-scale use and are resulting in better lumber for the domestic consumer, as well as aiding Southern lumber to compete in the foreign market. Southwestern farmers have been aided in securing durable fence posts. A service of unique type has been rendered to forestry in the determination for several forest regions of the methods of logging slash disposal that favor most rapid decay and thus decrease of the fire hazard. (The Forest Service, Bureau of Chemistry and Soils, and Bureau of Entomology and Plant Quarantine are cooperating).

Diseases of Shade Trees, Shrubs, and Chestnut Orchards.--Street, park, and ornamental trees make up a material part of the wealth of this country. Intangible values, such as reduction of temperature in summer and the enhancement of the beauty of a place, are difficult to estimate. Losses of trees from diseases, unfavorable climatic factors, and decay of the heartwood, with resulting breakage, are taking place in every locality of the country. The primary object of the work under this project is the prevention and reduction of these losses. Most of the diseases have never been investigated and others have been only partially studied. Improved methods of tree repair and better wound dressings are being studied. However, a large part of the funds in this project is required to determine the diseases and answer the correspondence sent in by the general public.

The increased number of visitors in our National and State parks have created new problems, particularly with reference to the packing of soil around

the more valuable trees and diseased conditions resulting. Many invaluable sites have already been severely injured. These problems and various others dealing with park conditions are being studied in cooperation with the National Park Service and some of the State parks.

The incipient chestnut-orchard industry in the East was wiped out by chestnut blight. Blight-resistant strains of chestnut introduced by this Bureau are being extensively tested as a basis for an orchard industry in the Eastern States. Among many thousands of seedlings, those in which resistance to the blight and root disease are combined with desirable horticultural qualities are being selected. Extensive breeding work to secure valuable hybrids is under way. As we normally import 20 to 25 million pounds of chestnuts from Europe, this is an agricultural industry that can be developed without danger of overproduction for many years. In the Western States, where the blight is not yet established, most of the planted chestnuts are blight susceptible, and efforts are being made to eradicate the few infections already found in that region and to put the industry on a basis of blight-resistant trees.

3. Epidemic Tree Diseases.--This project covers the investigation of diseases of forest and shade trees when they first appear in the United States. Knowledge of the causal agents and their behavior and the discovery of control methods may at that time make possible the ridding of the country of these diseases before they become established. Like the Red Cross, the work must meet the emergencies when they arise. The Dutch elm disease, discovered in a small way five years ago in Ohio and more recently in Maryland, Virginia, and Indiana, is now very serious around New York City, in New Jersey, New York, and Connecticut, where thousands of affected trees have been found. It threatens the life of the American elm. The investigations made under this project furnish the foundation for the joint Federal and State eradication campaign now under way. The European larch canker infection found in Massachusetts is important to the larch forests of the Northern and Western States. The cause and control of a canker disease of pitch pines is being studied. It is apparently serious on the slash pine of the Southeastern States, so important in turpentine production and of promise for the paper industry. The Woodgate rust, which occurs in New York State, is of danger to the pitch pine of the South and the Pacific Coast. An apparently threatening twig blight of the ponderosa pine in Arizona and New Mexico is being evaluated in its relation to that important pine. Willow scab is rapidly spreading over New England and southwesterly through New York and Pennsylvania; this disease has an important bearing on the use of willows in erosion control. (Bureau of Entomology and Plant Quarantine cooperating).

(1) FRUIT AND VEGETABLE CROPS AND DISEASES

Appropriation Act, 1937	$1,140,454
Budget Estimate, 1938	1,155,454
Increase	15,000

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)	Increase
1. Deciduous fruit investigations. .	$ 251,763	$ 262,269	$277,269	+$15,000(1)
2. Citrus, avocado, and other subtropical fruit investigations. .	109,051	109,539	109,539	- -
3. Nut investigations.	115,202	121,716	121,716	- -
4. Vegetable investigations. . . .	207,374	214,093	214,093	- -
5. Floricultural and ornamental horticultural plant investigations	70,038	73,288	73,288	- -
6. Nursery stock and farm shelterbelt investigations	67,142	67,230	67,230	- -
7. Potato investigations	78,522	78,634	78,634	- -
8. Methods of handling, transportation, and storage, and market diseases of fruits, vegetables, and flowers, investigations of .	168,939	169,485	169,485	- -
9. Investigations of variety, suitability, and quality in relation to fruit and vegetable utilization	43,976	44,200	44,200	- -
Unobligated balance	3,447	- -	- -	- -
Total appropriation	1,115,454 (a)	1,140,454	1,155,454	+ 15,000(1)

(a) For 1936 includes $600 allotted from "Forest Insects", Bureau of Entomology and Plant Quarantine (for azalea flower blight work); and excludes $36,338 allotted to "Agricultural Chemical Investigations", Bureau of Chemistry and Soils (for fruit and vegetable utilization work).

INCREASE

(1) An increase of $15,000 for a critical study of the factors influencing the production of higher quality deciduous fruits. A thorough study of the factors influencing successful tree growth and yearly production of higher quality fruit should be of immense value to the fruit industry. Such factors as type of soil in relation to physical condition, organic matter, and moisture should be determined. After the best site for an orchard is determined in relation to soil and air drainage, the interrelation of pruning, soil management, and fertilization upon the yearly production of high quality fruit can be studied. Such studies will not encourage the expansion of orchard plantings but should result in a higher yield per tree on the reduced acreage so that the cost of production will be decreased.

An item of $25,000 was requested of the last Congress for the initiation of a national deciduous-fruit breeding project to be organized in cooperation

with the State agricultural experiment stations for the development of improved varieties of higher quality fruit, resistant to diseases and low temperatures. Of this sum, $10,000 was granted in 1937. Although this amount will permit getting the work started this year it will not permit the proper development of this national cooperative project on an adequate basis, and the additional funds herein requested ($15,000) are needed in order that progress may be made in that direction.

Because this is a long-time project affecting all parts of the country, it is believed that the Government should take the lead in its prosecution. The production of good quality peaches, pears, grapes, and berries, particularly in sections of the United States east of the Rocky Mountains, is limited largely by the susceptibility of these fruits to diseases or by their lack of resistance to low winter temperatures. These crops over much of the producing territory are uncertain because of their sensitivity to low winter temperatures. Good quality pear varieties can not be grown in most sections because of susceptibility to fire blight. Grapes in the Southern States, with the exception of Muscadine varieties, are short lived and poorly productive because of susceptibility to root rot, black rot, and mildew. Few raspberry varieties are sufficiently disease-resistant to grow south of the Potomac and Ohio Rivers and westward. Strawberries can be grown in the Gulf region only with expensive spraying treatments. The greatest opportunity for improving production of these fruit crops throughout the United States is through an extensive program of breeding for increased disease resistance, increased hardiness, and improved quality.

CHANGE IN LANGUAGE

The following words have been eliminated from this item: "of which $3,600 shall be immediately available". This language was carried in 1937 to provide for prompt attack on the azalea flower-blight problem. With the work under way and proceeding normally, the immediately available authority is no longer necessary.

WORK UNDER THIS APPROPRIATION

General.--Under this appropriation investigations are conducted to determine the best methods of culture, propagation, breeding, selection, disease control, and related activities as affecting the most profitable production of high-quality orchard fruits, small fruits, nuts, vegetables, ornamentals, nursery stocks, and related plants. The interrelation of various orchard-management practices and problems concerned with the nutrition and physiology of the various horticultural plants are studied. Investigations for determining the best methods of harvesting, packing, shipping, storing, and utilizing horticultural products are also conducted, including the physiological and related changes of perishables during marketing and storage. In addition to cooperative activities with the State agricultural experiment stations, other bureaus of the Department of Agriculture and the Bureau of Indian Affairs of the Department of the Interior, field stations, laboratories, and offices are maintained at the following points:

Field Stations (Government-owned land)

Beltsville, Maryland
Brownwood, Texas(long lease)
Cheyenne, Wyoming(long lease)
Fresno, California
Indio, California
Meridian, Mississippi
Oakville, California
Robson, Louisiana

Field Stations (land furnished)

Eustis, Florida
Fort Valley, Georgia
Greeley, Colorado
Palo Alto, California
Philema, Georgia
Presque-Isle, Maine
San Diego, (Torrey Pines) California
Willard, North Carolina.

Field Laboratories

Albany, Georgia
Austin, Texas
Charleston, South Carolina
Chicago, Illinois
Corvallis, Oregon
East Wareham, Massachusetts
Fayetteville, Arkansas
Hood River, Oregon
Logan, Utah
Los Angeles, California
Madison, Wisconsin
Medford, Oregon
New York, New York
Orlando, Florida
Pemberton, New Jersey
Pomona, California
Riverside, California
Shreveport, Louisiana
Springfield, Missouri
Vincennes, Indiana
Wenatchee, Washington
Yakima, Washington

Field Offices

Riverside, California Sacramento, California

1. Deciduous Fruit Investigations.--Investigations cover production, breeding, and disease control for apples, pears, peaches, cherries, plums, apricots, grapes, raspberries, strawberries, cranberries, and other orchard and small fruits. The influence of pruning, fruit thinning, soil-improvement crops, fertilizers, and other orchard management practices on yield, regularity of crops, and quality of fruit is studied; also the functioning of fruit trees under varying soil moisture conditions. Cultural methods for strawberries, including effects of different plant nutrients on production, firmness, and quality of the fruit, are under investigation. The best root stocks and varieties for grapes in the Southeast and in the vinifera grape regions, especially in California, are being determined. Through fruit breeding and bud selection studies with apples, pears, peaches, plums, grapes, raspberries, strawberries, cranberries, and other small fruits, improved varieties of high quality and disease resistance are being developed. Through introduction, selection, and breeding, fruits are being developed that are adapted to withstand severe drought and cold conditions. Destructive fungous, bacterial, virus, and physiological diseases of all the more important kinds of deciduous fruits are studied for the purpose of determining their life histories, methods of dissemination, means of infection, and methods of control through spraying, disinfection, fumigation, eradication, breeding of resistant varieties, or other means. Efforts are made to develop new sprays superior in effectiveness to those now generally in use and which will not cause injury to host plants. These investigations are designed to determine methods of reducing the cost of production and at the same time result in a more uniform and stable production of high-quality fruit.

Immense investments are represented by the apple and other deciduous fruit industries. The production of apples varies from around 140,000,000 to more than 200,000,000 bushels annually, with a valuation ranging from about $100,000,000 to nearly $178,000,000, depending on crop and market conditions. The annual valuation of the peach crop formerly averaged around $60,000,000, though in recent years the average has been only about half that amount. The grape crop in recent years has had an average annual value of some $30,000,000; in former years the average was from two to three times as great. The strawberry crop in normal years has a farm value of $35,000,000 to $38,000,000. The farm value of the other deciduous fruits adds many more millions of dollars to the total. Annual losses due to the more prevalent fruit diseases have been estimated at about $50,000,000. Disastrously large proportions of fruit crops are frequently lost by growers, their income being reduced proportionately. The development and use of suitable control methods would largely prevent such losses and aid greatly in stabilizing yearly production - a factor of basic importance to the grower and consumer alike and to the fruit industry generally. One of the most serious handicaps to the farmer of fruit production is the wide fluctuation from year to year in the size of the crop and its cash return. The orchard management studies are projected with a view to inducing regular annual crops of high quality. Specific methods, often quite different, must be developed because of the different regional conditions under which fruit is grown. Most fruit varieties in cultivation originated as chance seedlings and many of them are faulty in various ways. Fruit breeding is conducted to develop disease-resistant varieties having better eating quality and varieties better adapted to various local conditions and having superior merit for shipping, storing, canning, drying, or preservation by other methods. The bud-selection work accomplishes similar results by taking advantage of bud mutations as they occur in nature. These lines of investigations are for the purpose of aiding fruit growers in the solution of problems which seriously reduce net income and which as individuals they are not in a position to solve.

2. Citrus, Avocado, and Other Subtropical Fruit Investigations.--Efforts are being made through breeding and bud-selection methods to develop improved citrus varieties resistant to disease and capable of producing more regular and profitable yields. More satisfactory root-stocks are being sought, and the effects of pruning, soil management, fertilization, and leaf area on the yield texture, storage, and shipping quality are being determined. Especial attention is being given to all production problems concerned in growing Satsuma oranges in the Gulf States. Variety studies, studies of pollination, pruning, and soil-management requirements, breeding and propagation investigations, and studies of factors affecting quality are being conducted with dates, avocados, mangos, figs, and other subtropical fruits. Diseases of citrus and other subtropical fruits are studied to determine their causes, methods of dissemination and infection, effects on the host plants, and the most effective and practical means of prevention or control.

For the years 1931-34 the average farm value of citrus fruits was about $98,000,000. The corresponding figure for the former years of 1928-29 was $162,300,000. The average annual production of avocados for the 5-year period 1928 to 1932 was 2,156 tons, having an average farm value of $518,000. The date crop amounts to about 5,500,000 pounds annually and is increasing. Similar figures for the mango and other subtropical fruits are not available. Certain of these fruits, such as the date, can be grown successfully in many of the hot interior valleys of the Southwest and will furnish a profitable crop for such

regions if their cultural requirements can be determined. Avocados and citrus fruits furnish profitable crops for several of the Western and Southern States.

3. Nut Investigations.--The work varies widely with the kind of nut and the region where grown. The merits of almond varieties are determined and improved varieties are being developed by breeding. Cultural requirements of the pecan to induce regular annual crops of well-filled nuts are being investigated. Habits of blossoming and pollination requirements of Persian walnut varieties as influencing yields are determined. Those conditions most favorable to growth and production of filberts are being studied. The merits, range of adaptability, and possibilities of black walnuts, various hickories, chestnuts, hazels, and other nuts are studied. The breeding and selection of improved varieties of filberts, walnuts, and other nuts are in progress. Serious diseases of pecans, walnuts, filberts, and tung nuts are being studied to determine their nature and modes of spread and development, and effective and economical methods of prevention or control are being worked out.

The average production of almonds in California for 1931-34 was 13,200 tons, average value $2,300,000; Persian walnuts, 38,500 tons, average value over $8,200,000; and the value of filberts in Oregon has ranged in the same period from $85,000 to $300,000 a year. Pecans, representing the one native nut of primary importance, averaged a yield of about 64,000,000 pounds for the years 1931-33, with range in valuation of from nearly $3,000,000 to more than $6,000,000 per year. The value of nuts for food purposes is generally recognized. Serious production problems exist with each crop. Many almond varieties of inferior value have greatly handicapped merchandizing the crop. Varietal studies have helped to determine those to discard. The need of improved varieties has been partially met in breeding work that is in progress. The pecan is a native nut only comparatively recently brought into cultivation in orchard form. Cultural requirements are largely unknown. Irregular and small crops of poorly filled nuts are disastrously frequent. Cultural methods that will overcome these difficulties must be determined if the pecan industry is to succeed. Many Persian walnut orchards have habitually been unproductive. The determination of cross-pollination requirements of the varieties has shown that such orchards may be made more productive and profitable when suitable cross-pollination is provided. Widespread interest prevails in the various hickories, black walnuts, butternuts, hazels, and other nuts suitable for growing in Northeastern United States. Collections are being made throughout the country of as many desirable wild seedlings as can be found, and these should be grown under uniform conditions to determine the value from the standpoint of quick growth, disease resistance, and uniform yields of high-quality nuts. Considerable plantings of tung nut trees have been made in recent years in the southern coastal plain region for the commercial production of tung oil, which is imported to the amount of about 100,000,000 pounds annually and extensively used in varnish manufacture and for other industrial purposes. The culture of this tree, new to North America, presents many problems in propagation, cultural requirements, orchard management, varietal selection and breeding, and disease control.

4. Vegetable Investigations.--These activities include studies of improved methods of handling seed, production of plants in plant beds, and establishing field plantings; studies of the adaptability of specific crops and varieties to different regions as affected by water supply, temperature, and other meteorological factors; the causes and control of numerous non-parasitic

diseases or abnormal growth and development troubles of vegetable crops; the study of fungous, virus, and bacterial diseases, their life histories, modes of dissemination and infection, and methods of control or prevention; the factors determining high culinary and market quality in vegetable products and methods of their control; the breeding and selection of disease-resistant vegetable varieties of improved culinary and market quality to meet specific market, shipping, or manufacturing requirements; the establishment of nationally applicable standards and descriptions of commercially important varieties. Cultural, varietal, and breeding investigations are made in relation to the successful production of vegetable crops under the drought and low-temperature conditions of the Great Plains area. Special breeding or selection investigations for disease resistance are being conducted with lettuce and muskmelon in California; celery in Florida; tomatoes in Florida, Utah, and California; peas and beans in Colorado, Washington, Idaho, and Oregon; cabbage in Wisconsin; potatoes in Maine, Minnesota, Michigan, Iowa, North Dakota, Louisiana, Maryland, and other States; and sweetpotatoes in Mississippi, Virginia, and Maryland.

According to the 1930 census and data of the Department of Agriculture, the total farm value of the crops receiving consideration in this project was about $800,000,000 in 1929. On account of low prices in the past few years, the total value of these crops is now far less. Losses from disease in the more important vegetables other than potatoes are estimated to amount to something like $84,000,000 annually. The estimated loss from potato disease alone is about $45,000,000, making a total estimated annual loss from diseases of $129,000,000. Much of this loss could be prevented if more effective spray materials and spraying methods could be developed. If disease-resistant varieties of high quality could be developed by breeding, great savings would result. Vegetable disease control is basic to stabilized production.

5. Floricultural and Ornamental Horticultural Plant Investigations.--Experiments with tulips, hyacinths, daffodils, lilies, and other bulbous flowering plants are conducted. The work includes a study of cultural methods and the effects of different storage conditions and handling methods on subsequent growth and flowering, the object being to regulate at will the time of flowering by appropriate treatment. Breeding and selection to develop improved types and varieties and the development of information regarding various new or little-known bulbous flowering species and types that possess potential commercial value are important phases of these investigations. Investigations are made to determine the value of different varieties of various groups of ornamental plants, including annuals, herbaceous perennials, roses, and other hardy plants and trees to determine their suitability for different uses and their adaptability to different climatic and other conditions. The arrangement of plant material for ornamenting home grounds and public buildings is studied, and the selection and use of plants and trees for park and roadside planting and for farm homestead improvements are receiving attention. Investigations are conducted on important diseases of roses, azaleas, boxwood, and other ornamental shrubs, florists' stocks, and flowering bulbs, with a view to determining the cause, means of spread, conditions influencing outbreaks, and methods of satisfactory control or prevention.

The main object of bulb culture investigations is to develop information needed by producers of bulbs in this country. Bulb production is an important industry and American planters use domestic rather than imported bulbs. In

1929 there were imported into this country 235,000,000 to 250,000,000 bulbs, including hyacinths, tulips, daffodils, crocus, lily, and other commonly grown stocks. The value was nearly $7,000,000. In 1932, the importation of the same items was 140,000,000 to 150,000,000 bulbs, with a value of about $2,260,000. Many American growers, largely as a result of these investigations, are now producing supplies of bulbs formerly imported. In these investigations methods are being developed that greatly simplify cultural practices and reduce cost of production. By use of special methods of storing and handling, practices are being originated so that florists may secure blossoms of iris and daffodils several weeks in advance of the usual time of blooming and at periods when good demand for them can readily be developed. This greatly extends the "forcing season" for these items, and at little or no added expense to the growers. More than 100 lily progenies from breeding work are being developed. Several lily hybrid selections of much promise and representing new types have been brought to the stage of introduction. These and other investigations of great potential promise to the industries are in progress.

With the expanding interest in recent years in the growing of ornamental plants, disease problems began to multiply, with corresponding demands made on the Department for help. Because of the universal interest in an extensive planting of roses and the seriousness of certain diseases, particular attention has been directed to them with a view to finding effective and practicable means of control. A similar situation prevails with respect to bulbs, lilies, and ornamental plantings. The work is directed to particular disease troubles that cause serious loss to the producers of particular kinds of florists' and ornamental stocks as well as to the purchasers and planters. There are no complete figures available on the loss due to diseases of ornamental plants. An estimate has been made of $2,500,000 annually due to diseases of greenhouse roses alone. The continuance of certain famous azalea gardens and boxwood plantings in the South is apparently contingent on the development of a satisfactory means of controlling very serious diseases that have recently attacked them.

The 1930 census report shows that in 1929 nursery sales included about 110,000,000 specimens of ornamental trees, shrubs, and other similar plants (not counting annuals, bulbs, and herbaceous plants). On April 1, 1930, there were growing in nurseries of the United States, for further development and future sale, about 340,000,000 specimens of the same items. The sales of florists' stocks, roses, carnations, and the like, grown in greenhouses and in the open during 1929, amounted to more than $98,000,000. The study of this type of material to determine the varietal merit and effectiveness and adaptability to different conditions and uses is necessary in order to supply information constantly and increasingly in demand by the public, also to determine the best methods of culture, including pruning, fertilizing, and general care. The development by selection of improved varieties, particularly of hardy chrysanthemums, to provide early and desirable flowering types for regions where the growing season is comparatively short is yielding results of large potential importance.

6. Nursery Stock and Farm Shelterbelt Investigations.--This work consists of selecting and determining the merits, both from the nurseryman's and the fruit grower's point of view, of different root stocks for use in propagating apple, pear, peach, plum, and cherry trees. Suitable vigorous and disease-resistant root stocks for outdoor hybrid tea roses and for use in propagating

rose plants for greenhouse forcing are being studied. Studies are being made of the propagation of other ornamentals, including also the propagation of fruit and rose stocks from seed and by grafting, layering, and cuttings. Experiments in the proper storage of nursery stock to determine optimum moisture and temperature conditions for best results are being made. Investigations are made of crown gall and other diseases of nursery stock and of various root diseases of fruit trees, with a view to determining their cause, the factors influencing their development, and the best means of prevention or control. Investigations are made relative to the best species of trees to use for shelterbelts, both under dry and irrigated conditions, in the Great Plains area, the best methods of planting and tree arrangement from the standpoint of checking wind velocity and snow drift, and the relation of the shelterbelt to the prevention of soil blowing and the retention of moisture.

Nursery sales during 1929, according to the 1930 census report, involved approximately 186,000,000 trees, shrubs, and other plants (excluding strawberry and other berry plants). As of April 1, 1930, the nurserymen had growing for further development and future sales nearly 490,000,000 of the same items. The value of the sales in 1929 amounted to about $95,000,000. Relatively little research work for the benefit of the nursery industry has been done in this country. Many of the problems concerning suitable understocks, methods of propagation, and the winter storage of nursery stock remain unsolved. An understock may lack hardiness or congeniality with the variety grafted on it, or it may lack insect or disease resistance, or adaptability to soil conditions, or in other ways it may lack qualities necessary to make it of permanent value to the planter. Great losses to both nurserymen and fruit growers have occurred in the past from the use of unsuitable root stocks. More rapid, less tedious, and less costly methods of propagating certain kinds of stocks are needed. Heavy losses from the destructive effects of improper storage conditions during winter are often suffered. Research on storage conditions for optimum results should save many thousands of dollars in such losses. Improvements in methods of disease control will prevent large losses and have a stabilizing effect on the industry. The best selection and proper arrangement of trees for shelterbelt planting in the Great Plains area should result in a more profitable agriculture and better and more pleasant surroundings in which to live. While living conditions in this area should be made much more pleasant, the effect on conditions of crop production should result in greatly increased financial returns to the owners.

7. Potato Investigations.--These investigations fall mainly into three groups: (1) Breeding and selection to develop new varieties that possess superior table quality, better adaptability to diverse soil, climatic, and other conditions, and resistance to disease; (2) cultural methods, including storing and handling of seed stocks to obtain optimum results; and (3) studies of the fungous, bacterial, virus, and physiological diseases of potatoes, their causes, modes of spread, effects on the plant, conditions influencing outbreaks, and methods of control or prevention. Breeding and selection work is carried on cooperatively in important potato-producing States -- Maine, Virginia, Maryland, North Carolina, New York, Michigan, Iowa, Minnesota, and others. Cultural investigations are conducted to determine the most profitable quantity of seed to use; time of cutting seed, and manner of handling thereafter; best methods of planting; most efficient use of fertilizers; amount of irrigation necessary in different regions; and effect on results of storing seed stocks at different temperatures and humidities.

The average farm value of the potato crop for the past five years has been about $266,000,000. In some years the value is as much as $477,000,000. The potato crop is vastly important to the farmer; it is the most important vegetable crop to the consumer based on volume used. Though extensive commercial production is restricted to perhaps a dozen States, the potato is the most universally grown of all vegetable crops. Problems of production are as varied as the diverse conditions under which the crop is grown. Low yields per unit of land prevail generally. Stabilization of production through greatly increased yields per unit of land, thus reducing acreage and lessening costs of production; better handling of seed stocks; and the development of varieties of superior quality and resistant to disease are some of the principal means of bettering the potato industry, particularly the producer. The estimated loss from potato diseases is about $45,000,000 annually, and any improvement in efficiency or economy of control measures would result in large financial savings.

8. Methods of Handling, Transportation and Storage, and Market Diseases of Fruits, Vegetables, and Flowers.--Experiments are conducted to determine the most effective methods of cooling and refrigerating fruits and vegetables in transit; best methods of car heating to prevent freezing while in transit during extremely cold weather; methods of controlling diseases of fruits and vegetables in transit, in storage, and while on the market; also the effect of ethylene and other gases in coloring fruits and vegetables. Methods of removing spray residues are investigated. Studies have been made of storage conditions, especially relating to temperature, humidity, duration of storage period, and ripening conditions after removal, which produce optimum results for canning, fresh fruit utilization, or for other purposes. As a result, some products of excellent quality have been obtained from types of fruit previously supposed to be unpromising for the purpose. Various other problems relating to handling, transporting, and storing perishable products are receiving attention.

Vast losses of fruits and vegetables occur in transit, in storage, and on the market as a result of disease, freezing in transit, or other conditions adverse to the product. Investigations that include the history and condition of the fruit when shipped or stored and the temperature and other conditions during transit by rail, boat, or other means and during storage and marketing periods are essential to get at the facts needed in correlating cause and effect. The removal of spray residues necessary to bring these products within legal requirements of tolerance has presented complicated problems that are entirely beyond the facilities and ability of growers and shippers to solve for themselves. The use of ethylene and other gases in treating citrus fruits for the purpose of eliminating the green color in fruit that is commercially mature requires research to determine the limit of usefulness of the process, methods of application, effect on the fruit, and other like factors, so that the growers, shippers, and the industry generally may take full advantage of its beneficial possibilities. The working out of storage and ripening details in handling Kieffer and other pears of the same type, that result in a greatly improved quality of fruit for canning and other purposes, should add very materially to the value of a type of fruit grown extensively and widely and which heretofore has had a relatively small value, in part because of its poor eating quality. These and other lines of investigations have aided and are continuing to aid very greatly in the handling of perishable products.

9. Investigations of Variety, Suitability, and Quality in Relation to Fruit and Vegetable Utilization.--This work includes the study of horticultural varie-

ties of fruit and vegetables in relation to their suitability for various standard methods of processing and manufacture to determine what varietal characteristics influence the appearance, palatability, and food value of the product, with view to developing by breeding and selection improved types that will furnish superior products; to study, in the case of a particular variety, the effect of varying storage and environmental conditions and cultural practices on its suitability for processing, on the quality of the product, and on the composition of the raw and processed product; and to conduct such physiological and related biophysical and biochemical studies as are necessary to determine differences in suitability of the crop materials for processing and in quality of the products.

The best figures available give the aggregate value of "canned and processed vegetables and fruits, and pickles, preserves, jams, jellies, and sauces, all industries," for 1929 as $721,845,902. The corresponding figure for 1931 is $481,416,068, a difference of a little over 33 percent between these two seasons. Even in seasons of comparatively light packs the quantity of fruit and vegetable products preserved by canning, freezing, and in other ways is impressive. Experience in the past has shown that improvement in appearance and quality of the pack increases consumer demand and widens the markets for such products, with consequent benefit to the growers of the raw materials. Varietal characters, stage of maturity, and factors of growth have a direct bearing on the appearance, palatability, and food value of the preserved products. The most profitable utilization of fruits and vegetables must be based on the suitability of different varieties for the particular methods of processing or manufacture.

(m) GENETICS AND BIOPHYSICS

Appropriation Act, 1937	$31,675
Budget Estimate, 1938	31,675

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)
Genetics and biophysics investigations	$31,291	$31,675	$31,675
Unobligated balance	384	- -	- -
Total appropriation	31,675	31,675	31,675

WORK UNDER THIS APPROPRIATION

The work under this appropriation includes studies of the mechanism of inheritance, by which characters are transmitted from one generation to the next; exploration of the possibilities of inducing new characters by various kinds of radiation, such as the X-ray, heat, and light; and investigation of

the possibility of influencing the growth of plants by modifying certain elements of the environment, with special reference to electric potential, light of specified wave lengths or colors, etc. The investigations are carried on in the laboratory and in the field on rented land at Lanham, Maryland, and at field stations operated by other divisions of the Bureau.

The justification for this work lies in the importance of a thorough knowledge of the mode and the mechanism of inheritance as a guide to developing methods for the improvement of plants by breeding, producing entirely new forms of plants that might have useful characters, and determining the interaction of plant growth with electrical, photoelectrical, and other radiation. The results achieved in previous years have made valuable contributions to a knowledge of heredity of importance to an understanding of plant breeding. Results also have been obtained on the effect of light of different wave lengths on germination of seeds that has made understandable certain problems in this field. Other earlier accomplishments have been equally valuable in providing a sound scientific basis for discountenancing the exploitation of certain electrical treatment procedures and other fantasies, with resultant savings to innocent individuals who otherwise might have been investors.

(n) MYCOLOGY AND DISEASE SURVEY

Appropriation Act, 1937	$45,818
Budget Estimate, 1938	45,818

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)
1. Investigations, identification, and collection of fungi	$15,961	$16,029	$16,029
2. Plant disease survey	22,228	22,263	22,263
3. Mushroom investigations.	4,523	7,526	7,526
Unobligated balance	106	- -	- -
Total appropriation.	42,818	45,818	45,818

WORK UNDER THIS APPROPRIATION

General.--The work under this appropriation includes the collection and study of plant parasites and other fungi, surveys of plant diseases in the United States, and investigations on the culture and diseases of mushrooms.

1. Investigations, Identification, and Collection of Fungi.--This project is concerned with the identification of fungi of all groups for Federal and State workers, students, teachers, and the general public; with supplying information on fungi to those interested; with the preparation of detailed studies of various fungus groups as a basis for routine identifications; and with the upbuilding and maintenance of a representative collection of the fungi of the world for reference and study purposes. Special problems include the

study of fungi attacking insects, of poisonous and edible field and forest mushrooms, and of parasites of destructive fungi, as well as the comprehensive indexing of the literature on plant diseases and fungi in general, in cooperation with the Plant Disease Survey. A fungus exchange service is maintained both as a means of securing new and valuable materials for the national collection and to supply workers in the State experiment stations and elsewhere with specimens needed for research or instructional work.

This project operates as a national service unit along the above lines, and the extent of the identifications and requests for fungus information supplied reaches a total limited only by the size of its staff. The fungus collection now totals over 300,000 specimens, with supplementary collections of photographs, microscopic preparations, and necessary covering indexes, and is one of the largest and most comprehensive of its kind in the world.

2. Plant Disease Survey.--Work under this project consists of collecting by means of surveys and through cooperation with State institutions and other agencies current information as to the occurrence, prevalence, rate of spread, and seasonal and geographical distribution of plant diseases in the United States, and as to the losses caused by them, as well as to the appearance of new and dangerous diseases or epidemics and unusual outbreaks of diseases. Files are maintained in which the information in permanent and accessible form is always available to plant pathologists and economists and others to whom they are of value. In cooperation with the Mycology projects, a file of plant-disease literature of the world is maintained. By means of a mimeographed periodical, current information on the status of plant diseases in the United States is distributed to plant pathologists in this country and abroad.

The work of this project is all national or broadly regional in scope. It is noncompetitive and is organized on the basis of cooperation with and services to the State and Federal workers in the field of its activity. It functions as a clearing house for information on plant diseases and is the only agency in the country which attempts to study the significance of plant diseases and the factors which regulate outbreaks on a material basis. More than 150 State experiment station workers from every State in the Union are included in the list of voluntary official collaborators served by the Survey, whose reports are recorded, preserved, summarized, and distributed to interested persons and agencies currently through the project's periodical and privately through correspondence or the courtesy of the files as the occasion may arise.

3. Mushroom Investigations.--This project is concerned at present with improvements in cultural practices and sanitary procedure in mushroom houses; with studies in the life history, behavior, and control of the "truffle" disease and other destructive mushroom troubles; with the development of new noncompetitive mushroom industries through work to establish in the United States cultivation of the European truffle and the Japanese mushroom and to grow under artificial conditions the Morel and other desirable wild types; and with studies to establish fundamental principles in the physiology and genetics of mushrooms and the interrelation of aeration, temperature, and other factors in mushroom compost heaps and related problems as direct aids to the industry.

The mushroom industry of the United States represents a capital investment of approximately $15,000,000, with annual gross receipts from mushroom products of about $5,000,000. In close connection with the industry, this project has

developed improved cultural practices and disease-control methods so as to lower production costs. It is also concerned with the development of similar industries through cultivation of other edible fungi (i. e., the truffle - a $6,000,000 industry in France). Popular interest is shown by the supplying, upon request, in a single year over 50,000 copies of publications on mushroom culture and diseases. Other definite results have been the development of an artificial compost to replace horse manure, when such a step is necessary, and the control of the "bubbles" disease.

(o) NATIONAL ARBORETUM

Appropriation Act, 1937	$34,307
Budget Estimate, 1938	42,000
Increase	7,693

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)	Increase
National Arboretum:				
(a) Maintenance and operation of arboretum	$43,307	$19,307	$27,000	+ $7,693(1)
(b) Planning, developing, and construction	14,235	15,000	15,000	- -
Unobligated balance	765	- -	- -	- -
Total appropriation	19,307	34,307	42,000	+ 7,693(1)

INCREASE

(1) An increase of $7,693 for additional costs for labor, fertilizers, and other materials for maintenance of increased area under cultivation and the maintenance, propagation, and protection of plant materials to be used in permanent plantings in the Arboretum. Most of the areas within the Arboretum site have not been under cultivation, or have been imperfectly farmed for years. In order to bring the soil to as high a state of fertility as possible before undertaking general plantings over the areas that are to be so planted, a regular program of soil building has been carried on. In view of the many additions to areas to be cultivated, additional funds are needed to extend this program. On account of the limited facilities for protecting nursery plantings from trespassers, a part of this sum may need to be used at either the National Arboretum site or at the Glenn Dale Md. station. In order that some of the living collections may be available for planting as soon as the Arboretum is ready for occupancy, continuation of this preliminary work is essential.

WORK UNDER THIS APPROPRIATION

The National Arboretum was authorized by Congress in an Act approved March 4, 1927 (U.S.C., title 20, Secs. 191-194) for research and education

concerning tree and plant life. A total of 385 acres has been purchased. The Arboretum in its final development will contain living examples of all species of woody plants suited to outdoor cultivation in this region that will furnish the basis for breeding studies with woody plants and ecological studies, as well as botanical work. It will provide also such library, herbarium, office, greenhouse, and nursery facilities as may be needed to carry out the scientific studies. Under this appropriation routine maintenance operations are conducted on the National Arboretum. A large amount of land still remains to be cleared, and the land already cleared should be prepared for planting. Collections of material now on the ground must be maintained and prepared for planting to prevent their total loss. This appropriation covers only bare maintenance and does not permit progress on plans for substantial development.

(p) NEMATOLOGY

Appropriation Act, 1937	$43,961
Budget Estimate, 1938	48,961
Increase	5,000

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)	Increase
Nematology investigations:				
(a) Plant parasitic and related nematode investigations . .	$41,675	$41,761	$46,761	+$5,000(1)
(b) Investigations on nemic parasites of insects and other invertebrates	2,000	2,200	2,200	- -
Unobligated balance	286	- -	- -	- -
Total appropriation . .	43,961	43,961	48,961	+ 5,000(1)

INCREASE

(1) An increase of $5,000, to finance work on bulb nemas made necessary through the lifting of the embargo against narcissus, with its return of free entrance of these and similar bulbs, and the resulting pest-control measures for such imported material.

The Division of Nematology plans to cooperate with the Bureau of Entomology and Plant Quarantine in investigations on the treatment for the control of the bulb or stem nematode, Anguillulina dipsaci, in various kinds of bulbs especially narcissus. This pest-control work will cover (a) studies on the nematode itself, particularly with respect to the revival of its dormant stage, which has proven resistant to any present known treatment; and (b) investigations on the application of hot water, vapor heat, vacuum, and other promising treatments of nematode control in infested, highly cured, imported bulbs. It is impossible to carry on this additional work with the present staff and funds.

WORK UNDER THIS APPROPRIATION

General.--It is widely known that parasitic nematodes or threadworms are the cause of numerous diseases in man and domesticated animals (hookworm, Ascaris, Trichina, etc.). It is not often realized, however, that numerous nematode species also parasitize lower animals (such as insects, millipeds, spiders, snails, etc.) or prey on plants (living in or on their roots, stems, leaves, flowers, or seeds) or live more or less free (thousands of species) in the soil and in fresh and marine waters. These nematodes, most often invisible to the naked eye because of their small size, interfere in many ways with human activities. They are the cause of some of the worst crop diseases, such as root-knot, which today is known to affect some 900 different kinds of plants, including a large portion of our most valuable crops (cotton, tobacco, Irish and sweet potatoes, tomatoes, lettuce, peach trees, grape vines, etc.) and ornamental plants - even various forest trees. There is the so-called sugar-beet nematode, a very dreaded pest, which attacks some 200 different hosts, formerly known mainly as the cause of "beet tiredness" or "beet sickness" of the soil but recently the subject of very drastic measures in various potato-growing regions of Sweden, Great Britain, and Germany. Then, there may be mentioned the bulb or stem nematode, a species also known to attack some 250 different host plants and in some cases very detrimentally, e.g., narcissus bulbs, alfalfa, clover, sweetpotatoes, and Irish potatoes. This form is subject to quarantine (No. 62). Another form, the strawberry nematode, is principally known as the causative agent of strawberry dwarf or crimp but also attacks a wide variety of plants, especially ornamentals such as begonias, ferns, and chrysanthemums. Other outstanding nematode pests of plants are the wheat nematode (the cause of cockle ears), the citrus nematode, the meadow nematode, the burrowing nematode (mostly on tropical and subtropical plants like sugarcane, coffee trees, etc.), and numerous forms which are less important or little known at present.

The insect parasitic nematodes are thought to be one of nature's means of keeping insect and similar pests in control. In regions where grasshoppers never develop into damaging swarms, it is thought that parasitic nematodes of the group known as mermithids (sometimes called "hairworms" or "horsehair snakes") are the main natural controlling factor. These mermithids, however, require certain climatic and moisture conditions for their proper development and are therefore unable to exist in the semiarid regions where grasshopper plagues regularly occur.

Work of this character is of a highly specialized type, necessitating detailed training for the investigator. There are few such specialists, so that most State and private agencies must rely on the Division of Nematology as the sole agency from which to obtain information as to the possibility that a given disease may be caused by nematodes and advice as to procedure and control.

(a) Plant Parasitic and Related Nematode Investigations.--Each year activities under this project cover the examination and correspondence relating to six to eight hundred samples of plant and soil material and numerous inquiries pertaining to nematode diseases of plants and the significance of soil-inhabiting forms for crop production and soil fertility. Such problems are presented as the significance of forms found in deteriorating lumber, or in freshwater filter beds, or in vinegar, or in animal skins during the tanning process, etc. Planned research activities comprise investigations into the life habits and development of the following plant parasitic forms: Root-knot

nematode, sugar-beet nematode, bulb or stem nematode, and strawberry nematode. The following control methods are being investigated: Crop rotation for the various nematode pests and their regional application; cultural control such as early planting, frequent cultivation, submersion, and fallowing; seeking and testing nematode-resistant crop plants and ornamentals; breeding resistant varieties of susceptible crops; testing chemical and other soil-disinfection methods; and developing therapeutical methods to cure infested plants by killing the nematodes without harming the plants through hot water, vapor heat, vacuum treatment, or chemical therapeutics (iodine, etc.).

To estimate the savings resulting from these activities is difficult. They touch home gardens as well as large-scale crop production and cover items such as these: A truck gardener is informed how to again grow healthy carrots instead of his knotted, unmarketable, root-knot-infested crop; a greenhouse man is told how his unmarketable, leafless begonias can be cured by controlling the strawberry nematode; a real-estate company is informed how by proper procedure they may avoid further losses to shade trees affected by nematodes in their city development. The yearly savings through the activities under this project amount certainly to more than ten times the amount of the whole appropriation.

(b) Investigations on Nemic Parasites of Insects and Other Invertebrates.- Activities under this project include the examination of and correspondence relating to some fifty to eighty sample collections of nematodes parasitic in lowe animals, such as snails, earthworms, and insects (barkbeetles, Japanese beetle, mosquitoes, gypsy moth, grasshoppers, etc.). Such collections are submitted for information regarding the possible significance of the parasites as natural enemies of these pests. Investigations on the taxonomy, life history, and economic significance of the mermithids, forms known particularly as grasshopper parasites, are now being prepared for publication.

Colonization of mermithids to control grasshoppers in regions where outbreaks of this insect occur regularly as yet have not been successful. The results obtained through these investigations, however, are of great scientific value since they add a new page to our knowledge of how nature controls the ravages of insect and similar pests in certain regions.

A group of very efficient insect parasites (the Neoaplectanas) was recentl discovered attacking the larval stages (soil phase) of such pests as the Japanes beetle, alfalfa weevil, fall army worm, spotted cutworm, house-fly larva, corn earworm, etc. Experiments are showing that these parasites may be raised in large numbers on artificial media for colonization purposes, and it is hoped that methods can be developed by which these parasites may be used as an efficient factor in the control of these pests.

(q) PLANT EXPLORATION AND INTRODUCTION

Appropriation Act, 1937	$204,483
Budget Estimate, 1938	204,483

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)
Plant exploration and introduction:			
(a) Plant exploration and collection	$52,832	$54,606	$54,606
(b) Field testing of introduced plants	133,690	128,969	128,969
(c) Plant geography and bibliographical investigations	17,378	20,908	20,908
Unobligated balance	583	- -	- -
Total appropriation	204,483	204,483	204,483

WORK UNDER THIS APPROPRIATION

General.--This Division serves as a cooperative and coordinating agency for securing from all parts of the world new, rare, and promising plants that may be useful in the development of new crop industries, directly for the diversification or expansion of economic needs, or as material to be used by plant breeders, especially as related to the development of disease and insect-resistant crops. Initial protection is provided against the introduction of foreign insects and diseases, and preliminary propagation and tests are conducted at four widely separated field stations. Cooperation is maintained with crop specialists in the U. S. Department of Agriculture, State agricultural colleges and experiment stations, botanic gardens, arboreta, nurserymen, and with selected lists of specially qualified private individuals. Studies are conducted of potential crop plants and of soil and climates of foreign countries as compared with this country, with a view to obtaining materials for introduction most adapted to our needs.

This Division is now generally recognized as the clearing house through which needed plant material is most effectively received. It is also recognized in this country and abroad as the most effective agency in exchanging plant material with foreign research workers, and results obtained have been so effective that its organization and procedure have been studied by other countries as a basis for the establishment of similar organizations. Introductions obtained by exploration and through contacts built up with foreign research workers, nurserymen, botanists, explorers, and plantsmen, as well as our own consular officers and commercial and agricultural attaches, have developed into important crops having a high economic value in our domestic agriculture.

(a) Plant Exploration and Collection.--Foreign explorations are carried on by agricultural explorers for the purpose of receiving new and promising types of plants superior to those now grown in this country or having promise in aiding in the development of new crop industries and further advancing our agricultural and horticultural interests through breeding, development of

disease-resistant crops, and meeting the changes in shifting economic needs, as well as contributing to such broad problems as erosion control, range improvement, and beautification of the home and its surroundings. As an adjunct to field operations, worldwide exploration work is carried on through correspondents and collaborators in foreign countries, having in view the same objects and purposes.

Since this work is carried on with a view to aiding agriculture in all parts of the country, it is widely regional. Important grain introductions include varieties of wheat, barley, rye, oats, rice, and grain sorghums which have become standard over wide areas of our grain-growing regions. Forage introductions of varieties of alfalfa, soybeans, lespedezas, grasses, and vetches include many which have become an indispensable part of our agriculture. One cotton variety, the Acala, has been developed into the single variety of importance around which the cotton industry of the Southwest largely centers. As a result of most recent explorations, potatoes, tobaccos, and a wide range of vegetables have been received for work in major breeding projects for other divisions of the Bureau of Plant Industry. While results in the field of horticulture are slower because of the long-time nature of most of the crops, certain introductions of citrus fruits, avocados, and nectarines have become commercially important crops and other introductions have been of material assistance to breeders in the development of new varieties and disease- and insect-resistant root stocks.

(b) Field Testing of Introduced Plants.--Experimenters' service activities under this appropriation include the widespread regional testing of all introduced plant material, with a view to determining its adaptability to the soils and climates of this country. This is accomplished by means of organized cooperation with crop specialists of the United States Department of Agriculture, State agricultural colleges and experiment stations, botanic gardens, and arboreta, together with selected lists of nurserymen and private individuals. Similar tests and experiments are carried on at four special plant-introduction gardens so located as to receive widespread regional effects of soil and climate.

This work is an essential part of plant introduction. Before extensive cultivation of introduced plants can be advised, reliable information must be obtained concerning their adaptability and their potential value to American agriculture and horticulture. This information can be obtained only by means of widespread field tests. A vital activity of this service is to prevent the bringing in of new insect pests or diseases incident to the introduction of plant material. Special facilities for growing and propagating under quarantine and detention, under rigid control, are utilized for this purpose.

(c) Plant Geography and Bibliographical Investigations.--Studies are made of the relation of crop distribution to climatic and soil conditions and of the important problems of plant introduction from a geographical point of view for the purpose of locating foreign sources of potentially valuable crops and to insure that such crops, when introduced, will be provided with soil and climatic conditions suited to their needs. This work is essential to the development of a proper and intelligent background for plant introduction and the necessary testing work connected therewith. Its purpose is to chart the field in advance so that a minimum of time and effort will be lost in the search for new crops and the proper placing of these crops for experimental use. Unless adequate plans are made in advance through this project, much of the efficiency of the introduction procedure would be lost.

(r) PLANT NUTRITION

Appropriation Act, 1937	$16,024
Budget Estimate, 1938	16,024

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)
Plant nutrition investigations, including effects of length of day on growth	$15,928	$16,024	$16,024
Unobligated balance	96	- -	- -
Total appropriation . .	16,024	16,024	16,024

WORK UNDER THIS APPROPRIATION

The great variation in influence of certain crops on both yield and quality of succeeding crops in the rotation system is particularly important. Plant nutrition investigations are directed toward the determination of the extent and significance of the influence of these variations, particularly on yield and quality of crops included in the rotation, and include the relative plant-food requirements of the crops in the rotation system. Laboratory and field investigations are conducted to determine which of the chemical elements are essential for normal plant growth and the functions of these elements in the nutrition of the plant, with special reference to elements required only in very small quantities. Studies are also made of the effect of length of day on growth, development, and composition of plants, including effects of the daily duration, the intensity, and the color or composition of the light. The work is carried on with the same personnel as those engaged in Tobacco Investigations.

The practical importance of the cropping system on yield and quality of crops is illustrated by recent field trials in which a weed fallow preceding tobacco has consistently raised the market value of the tobacco crop from an average of $125 to approximately $375 per acre because of remarkable improvement in yield and especially in quality of the leaf. Other crops also may be greatly affected by the rotation system. The nutrition studies are demonstrating that for many important soils it is necessary to include in the fertilizer mixtures materials which will supply certain chemical elements not previously considered, such as magnesium, calcium, sulphur, and boron. These results have an important bearing on the correct use of the new highly concentrated fertilizer materials. Discovery of the remarkable effects of seasonal and latitudinal change in length of day on the growth and the flowering and fruiting of plants is being effectively applied to the production of seed of certain varieties of tobacco under short-day conditions in the South, while the crop of commercial leaf is grown in northern latitudes where seed can not be produced because of the long days. The principles are now being found to largely govern the northerly or southerly range of the different varieties and strains of various crop plants. They are also finding practical application in the commercial production of certain flowers,

such as chrysanthemum, several weeks in advance of their normal season by shading to shorten the day length. This method of hastening and controlling time of flowering is being extensively used in the production of new varieties of crop plants by breeding.

(s) RUBBER AND OTHER TROPICAL PLANTS

Appropriation Act, 1937	$46,749
Budget Estimate, 1938	46,749

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)
Tropical economic plants, Investigations of:			
(a) Rubber production and breeding investigations	$19,866	$20,049	$20,049
(b) Miscellaneous economic tropical crop studies, including coffee, cacao, coconut, papayas, oil palms, bananas, and other minor crops of potential importance	26,575	26,700	26,700
Unobligated balance	308	- -	- -
Total appropriation	46,749	46,749	46,749

WORK UNDER THIS APPROPRIATION

Under this appropriation experiments are conducted bearing on the introduction into cultivation of foreign and native plants of potential value in the production of rubber and on the acclimatization and adaptation of various tropical crop plants to the warmer regions of the United States. Studies are conducted with such crop plants as cacao and coffee. Plantings are maintained in southern Florida, and selections are made of species and strains which are found to be adapted to the warmer sections of this country. Rubber investigations involve the study of both foreign and native plants containing rubber and the selection of high-yielding strains and experiments on methods of rubber extraction. Other plantings of non-tropical rubber-producing plants, chiefly goldenrods, are maintained in Georgia, and studies are made of native and hybrid strains for the production of rubber of this type. Investigations of tropical plants are essential to the establishment of new crops and ornamentals in the South. Experiments and tests conducted at plant-introduction stations have resulted in the selection of a large number of tropical plants adapted to cultivation in the South, and other plants now being tested have shown promise of being valuable additions to south tropical horticulture.

Rubber investigations constitute the most important phase of tests now under way. Over half of the world's output of rubber is consumed in the United States. No other commodity which is not produced in commercial quantities inside our borders is of more importance in our American life. Not only do we produce no rubber in important quantity, but the source of 90 percent of our rubber is thousands of miles away in the East Indies and might be cut off entirely either by economic manipulation or military mischance, or the price might be raised so high by restrictive combinations of producing areas as to compel us to pay a high premium to foreign investors. In case of war, our very existence might depend on assurable supplies of rubber. Also, actual or potential production of rubber in the United States would act as a curb to check foreign combinations formed to increase the cost of rubber artificially.

(t) SEED INVESTIGATIONS

Appropriation Act, 1937	$67,293
Budget Estimate, 1938	72,293
Increase	5,000

PROJECT STATEMENT

Project	1936	1937 (Estimated)	1938 (Estimated)	Increase
1. Seed testing investigations.	$39,050	$39,054	$39,054	- -
2. Federal Seed Act Enforcement	27,549	27,989	32,989	+$5,000(1)
3. International Seed Testing Congress, expenses to meet the share of the United States for the	250	250	250	- -
Unobligated balance	444	- -	- -	- -
Total appropriation	67,293	67,293	72,293	+ 5,000(1)

INCREASE

(1) An increase of $5,000 to provide for the more effective enforcement of the Federal Seed Act. The soil-conservation program is resulting in largely increased demands for seed of forage crops. Coincidently, the severe drought has resulted in acute shortage of seed of many of the forage crops. Finally, there is a constantly increasing consciousness within the States of the importance of high-quality seed, with consequent increased activities in seed inspection. The Federal Seed Act places on this Bureau the obligation of cooperating with the State seed officials to prevent interstate shipment of seeds in violation of that Act. The activities in the States have reached a point where we are unable adequately to meet these obligations by providing reasonably efficient enforcement, and the increase requested is for that purpose.

CHANGE IN LANGUAGE

The spelling of the word "adulterated" has been corrected.

WORK UNDER THIS APPROPRIATION

General.--The Division of Seed Investigations protects the quality of seeds used in the United States through research and law enforcement.

1. Seed Testing Investigations.--The research work is planned to find means by which various crop and weed seeds similar in appearance may be separated and identified and to prepare descriptions and illustrations to make the work available to others; to determine the kinds of weed and other seeds which occur in agricultural seeds produced in different seed-producing areas of the world as an aid to determine the origin of particular lots of seed in relation to their adaptability for use in any given region; to study the physiology of seed germination and the procedure for testing seeds to indicate their plant-producing value, including those which require unusual treatment during the germination test; to determine the influence on the vitality of seeds of conditions of production and storage and of their movement from one climatic area to another having widely different humidity and temperature conditions; and to determine the length of time seeds will retain their vitality when buried in soil as related to weed distribution and weed eradication. As a result of these functions, it is now possible to definitely separate and identify most of the agricultural grasses, the vetches, and many of the Brassicas, as well as many other crop and weed species.

A comprehensive study of the foreign seeds found in red clover and alfalfa from various countries of the world is being prepared for publication. It is such knowledge, resulting from fundamental research, that has placed the sale of agricultural seeds on a definite basis and has made seed control possible.

Methods have been developed to hasten germination of seeds of many groups of cultivated plants where germination has been found difficult. These studies have dealt both with problems designed to advance our knowledge of the general principles of seed germination and with specific difficulties in the carrying out of tests of the viability of seeds. Continued emphasis has been placed on the primary importance of determining possible agricultural value when testing seeds for germination.

Preliminary results of the storage experiments already have revealed facts that should be of service in both foreign and domestic trade in seeds. One buried seed experiment has shown the ability of some seeds to remain for at least 30 years in the soil and then make vigorous plants. Another trial shows the ability of red rice to remain viable in rice fields for several years.

Seeds are examined to determine their kind, adulteration, freedom from other crop seeds and weeds, plant-producing power, and region of production. These examinations are made for investigators in the U. S. Department of Agriculture, various Government purchasing agencies, State officials, farmers, and dealers in seeds. During the past year many tests have been conducted for such organizations as the Soil Conservation Service.

Seeds to be exported are analyzed and certificates issued to exporters in compliance with the agreement of the International Seed Testing Association. In this connection, cooperative seed-testing laboratories are maintained at Sacramento, California; Corvallis, Oregon; Lafayette, Indiana; and Columbia, Missouri.

2. Federal Seed Act Enforcement.--The import provisions of the Federal Seed Act regulate the quality of the more important forage-crop seeds imported into the United States and indicate the general inadaptability of imported alfalfa and red clover. The interstate clause prohibits the interstate shipment of all seeds which are fraudulently misbranded.

Every lot of seed subject to the import provisions of the Federal Seed Act is sampled by the U. S. Customs Service, and all samples are tested by the Office of Seed Investigations of the Bureau of Plant Industry and only those meeting the requirements of the Act are permitted entry. The coloring of all imported seed of alfalfa and red clover is also supervised by the latter office. The result of the enforcement of the import provisions of the Act has been to keep out of the country seeds which are of low quality. The coloring provision for alfalfa and red clover has resulted in a nationwide agronomic trial of imported vs. domestic seed which has been carried on without cost. The common knowledge that, with certain exceptions, imported seeds of alfalfa and red clover are generally inferior has been one of the contributing factors in the reduced imports of the seeds of these two major forage crops.

The interstate clause of the Act insures each State protection against shipment into the State of fraudulently misbranded seed of any kind, the States themselves not having authority to prevent such shipment. The enforcement of this clause of the Act has been carried on in cooperation with State authorities and has resulted in prosecutions for the shipment of misbranded seeds of oats, rye, vetch, soybeans, cowpeas, clover, alfalfa, sorghum, and other seeds on account of misbranding as to origin, variety, adulteration, percentage of pure seed, and germination.

International Seed Testing Congress.--Under this project participation in the International Seed Testing Congress on the part of the United States is authorized to the extent of $250 annually. The Seed Testing Congress is endeavoring to set up international rules for testing seed to insure uniformity.

(u) SOIL-FERTILITY INVESTIGATIONS

Appropriation Act, 1937	$172,157
Budget Estimate, 1938	172,157

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)
1. Soil-fertility investigations . .	$132,559	$134,107	$134,107
2. Cotton root-rot soil and fertilizer investigations	34,365	38,050	38,050
Unobligated balance	5,233	- -	- -
Total appropriation	172,157	172,157	172,157

CHANGES IN LANGUAGE

The words "and soil amendments" have been eliminated from this paragraph, since the term "fertilizers" is believed to be sufficiently broad to cover all soil amendments. As amended, the item will read:

> For soil investigations into causes of infertility; maintenance of productivity; effects of soil composition, cultural methods, and fertilizers [and soil amendments] on yield and quality of crops; and the properties, composition, formation, and transformation of soil organic matter, $172,157.

WORK UNDER THIS APPROPRIATION

General.--Work under this appropriation consists of studies of soil fertility and fertilizer problems to develop economical practices which will enable the farmer to reduce his cost of production and obtain crops of better quality. The work involves determining the fertilizer requirements of different soil types for different crops and the influence of fertilizer elements on the growth, maturity, yield, quality, and disease resistance of crops; biochemical soil and fertilizer studies on the relation of organic matter, green manure, and crop residues to soil fertility; cotton root-rot soil and fertilizer studies; and soil-improvement investigations in the sandhill section of the South. Knowledge of inherent soil fertility and the relative adaptability of specific soil types to specific crops and knowledge of the particular fertilizers required to supplement natural soil fertility for certain crops are important factors in reducing cost of crop production. Moreover, every acre of crop soil is subject to depreciation and decreased efficiency if proper methods of soil fertility maintenance are not followed--a factor in conservation of invested capital as well as in cost of production.

1. Soil-Fertility Investigations.--Under this project the fertilizer requirements of the principal soil types and agricultural regions are being determined for a number of important crops, including cotton, sugarcane, sugar beets, potatoes, truck crops, citrus fruits, pecans, and green-manure crops. The most suitable fertilizer ratios, the most desirable kind and amount of each fertilizer ingredient to use, and the most economical rate of application are determined. The work involves the establishment of field experiments on prominent soil types in cooperation with State experiment stations and leading farmers. Field laboratories are located at Houma and Shreveport, Louisiana; Orlando, Florida; Albany, Georgia; Columbia, South Carolina; Chadbourn, North Carolina; Scottsbluff, Nebraska; and Davis, California; and field experiments are conducted in those States and in Maine, New York, New Jersey, Pennsylvania, Virginia, South Carolina, Ohio, Michigan, Montana, Idaho, Colorado, and Utah. Biochemical soil and fertilizer studies are made at Arlington Farm on the nature, quantity, and distribution of organic compounds in soils and their effect on biological activity, on the changes brought about in soil constituents by growing plants, and on the changes which fertilizer salts undergo in soils and their effects on plants, which researches are of fundamental importance in developing sound fertilizer usage. Soil-fertility investigations are designed to enable the farmer with the least possible outlay to obtain the greatest net return for his work through reduction of unit cost and meeting the demands for better-quality products.

2. Cotton Root-Rot Soil and Fertilizer Investigations.--Work under this project has for its objective the development of means for reducing losses resulting from root-rot of cotton. Over 9,000,000 acres in the Southwestern States are infested with root-rot. Work is carried on at the field station at Austin, Texas, and fertilizer experiments are at present conducted in nine counties of the Texas black-land belt. The work consists of field and laboratory studies to determine the influence of fertilizers and soil amendments on cotton root-rot, the chemical and physical difference between infested and non-infested soils, and the influence of cultural methods and crop rotations in conjunction with the use of fertilizers in the control of root-rot. The work is cooperative with the University of Texas and the Texas Experiment Station.

(v) SOIL MICROBIOLOGY INVESTIGATIONS

Appropriation Act, 1937	$39,854
Budget Estimate, 1938	39,854

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)
Soil microbiology investigations:			
(a) Soil inoculation investigations and inspection of cultures	$19,000	$19,000	$19,000
(b) Soil population investigations in relation to crop production, bearing primarily on fungi, bacteria, algae, etc.	20,154	20,854	20,854
Unobligated balance	700	- -	- -
Total appropriation	39,854	39,854	39,854

WORK UNDER THIS APPROPRIATION

Work under this appropriation includes tests and inspection of commercial cultures of legume nodule bacteria and of soil inoculants to insure that cultures sold to farmers are true to type, viable, and efficient for the purpose claimed. Research is also conducted on legume nodule bacteria in connection with the efficiency of strains, influences which alter their quality or interfere with their functions, methods of practical application, and the development of special strains for all legume crops, including those newly introduced into this country. Since the proper nitrogen-fixing bacteria must be applied to legume seed wherever the growing of a particular crop is extended into a new area, a tested collection of strains is maintained to aid in the establishment of new crops in cooperation with State experiment stations, county agents, and individual farmers. Other researches cover the decomposition of green manure, cover crops, and crop residues; the effect of soil reactions and soil treatments on

the microorganism and their activity in the soil; studies of the organisms responsible for the decay of soil organic matter; and studies on the use of fungi and bacteria for determining the fertilizer needs of soil. These investigations are planned to obtain a better understanding of the nitrogen economy of the soil and the relation of its micropopulation to different manuring and cropping systems, with the view to increasing the efficiency of farm practices.

(w) SUGAR-PLANT INVESTIGATIONS

Appropriation Act, 1937	$312,079
Budget Estimate, 1938	412,000
Increase	99,921

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)	Increase
1. Sugar beet investigations:				
(a) Sugar-beet leaf-spot and root-rot control investigations	$34,943	$34,600	$34,600	- -
(b) Sugar-beet curly-top control investigations, including breeding and other means.	95,950	97,990	97,990	- -
(c) Sugar-beet production and breeding investigations	75,818	75,818	75,818	- -
Total, Sugar beet investigations	206,711	208,408	208,408	- -
2. Sugarcane investigations:				
(a) Sugarcane cultural investigations	31,595	31,959	31,595	- -
(b) Sugarcane disease investigations	31,277	31,277	31,277	- -
(c) Sugarcane breeding investigations	33,004	33,447	33,447	- -
(d) Sugarcane deterioration in storage, Investigations of	7,352	7,352	7,352	- -
(e) Sugarcane investigations at Houma, Louisiana.	- -	- -	99,921	+ $99,921 (1)
Total, Sugarcane investigations	103,228	103,671	203,592	+ 99,921 (1)
Unobligated balance	2,140	- -	- -	- -
Total appropriation	312,079	312,079	412,000	+ 99,921 (1)

INCREASE

(1) An increase of $99,921 for land and facilities at Houma, La. This increase will provide for the purchase of land and the erection of laboratory, greenhouse, and service buildings, and the purchase of equipment in connection with the sugarcane investigations of the Department of Agriculture at Houma, La.

The Department has heretofore rented privately owned buildings and land in connection with research and investigations on sugarcane conducted at its Sugar Plant Field Station at Houma, Louisiana. The building formerly used as a laboratory has been destroyed by fire, since which time the Department has endeavored to carry on its work in inadequate buildings and under highly unsatisfactory conditions. It is essential that the Department acquire the necessary land at Houma and erect thereon buildings of a permanent nature designed to insure the continued and efficient conduct of its research and investigational work on sugarcane. It will also be necessary to purchase certain equipment to replace that destroyed by the fire.

The buildings are needed to house investigational work of four bureaus of the Department, namely, Bureau of Plant Industry, Bureau of Entomology and Plant Quarantine, Bureau of Chemistry and Soils, and Bureau of Agricultural Engineering. This station is the principal station maintained by the Department for researches and investigations on sugarcane, and the projects involved (including the study and introduction of improved disease-resistant varieties, research on diseases and insect pests and means for their control, study and improvement of field practices and soil utilization, and development of means for preventing losses of sugar) will require a long-time program in this important sugar producing section. The buildings now occupied are of frame, non-fireproof construction, and the fire above referred to resulted in extensive loss of valuable Government property. The present quarters are inadequate for the work, and it will be necessary to rent additional laboratory space and other facilities unless the proposed buildings are provided.

The buildings needed are a two-story fireproof laboratory building containing approximately 12,000 square feet of available working space, with chemical and biological laboratory equipment; a small cold-storage plant with refrigeration space; several small rooms for maintaining high constant temperatures; two greenhouses with headhouse containing 1,000 square feet of floor space; and a garage adequate for housing Government-owned automobile equipment. The personnel at this station will number approximately 21 technical workers, in addition to a number of laborers. The proposed buildings and equipment will greatly facilitate the important experimental work which is conducted and will practically eliminate fire hazard.

CHANGE IN LANGUAGE

A clause has been added to this item making $100,000 immediately available and providing that not to exceed $12,500 of this amount may be used for land purchase at Houma, Louisiana, in connection with this work. The $100,000 will provide, in addition to land purchase, for the erection of laboratory, greenhouse, and service buildings and for the purchase of equipment, as well as for personal services in the District of Columbia for the preparation of plans. The new language also provides that the limitations in the Agricultural Act as to the cost of farm buildings shall not apply to this paragraph.

WORK UNDER THIS APPROPRIATION

General.--The work under this appropriation consists chiefly of research on the problems connected with the growing of sugarcane in continental United States, Puerto Rico, Hawaii, and the Virgin Islands and the investigation of sugar-beet and beet-seed problems in the United States, including the control of diseases affecting these crops.

1. Sugar Beet Investigations.--Under this project superior yielding varieties of sugar beets are being developed, strains resistant to disease are selected for increase, types better adapted to conditions in this country are produced, experiments involving comparative studies of cultural practices are performed, and special methods for the control of curly-top and other serious diseases, including special investigations in cooperation with the Bureau of Entomology and Plant Quarantine for the control of the curly-top disease of sugar beets transmitted by the leafhopper, are being studied. The sugar-beet industry is particularly interested in the investigations on field methods of controlling diseases and in the increase of seed supplies of disease-resistant sugar beets.

Sugar production from beets in the continental United States has, by recent enactment, been stabilized at 1,550,000 tons. Approximately 1,000,000 acres in 18 States are used for beet growing, and in these States the beet is an important element in the cropping system. The capital investment in farm lands, farm equipment, irrigation systems, factories, factory equipment, and transportation and power facilities directly concerned in sugar-beet production and beet-sugar manufacture may be conservatively placed at $350,000,000. The capital investment in important subsidiary industries furnishing supplies and service to the beet industry and in the livestock industry directly concerned in utilizing sugar-beet by-products as feed would more than treble this figure. For the 1933 crop, the fabricated products, -- beet pulp, molasses, and refined sugar -- had a value in excess of $127,000,000, and the sugar-beets were worth, on the farm, $58,000,000. The sugar-beet crop, in good years, has been a profitable crop for the farmer to grow. It should be even more favorably considered with a parity price to be paid farmers for sugar beets. The crop, however, because of ravages of disease, improper cropping practices, and soil depletion, has been an extremely hazardous one in many regions. A truly stabilized and safe beet agriculture can be secured only when the enormous losses to farmer and factory arising from disease epidemics and from inefficient crop practices are removed by the findings and application of agricultural research. Gratifying progress in the development of strains of sugar beets resistant to curly-top and leaf-spot (the principal diseases of beets) has been made, and one strain showing a measure of resistance to curly-top has been released for commercial culture. Strains of greater promise are in process of development and test, forecasting the eventual removal of these disease hazards, which take a toll of many millions of dollars every year and threaten the existence of a large proportion of the industry, with capital investments of over fifty million dollars. Successful fruition of work on disease-resistant strains of sugar beets will incidentally bring a new industry to American farmers--the commercial production of sugar-beet seed--the beginning of which, attributable entirely to this research, was started on a substantial basis in 1933, and in future years, if work is actively continued, will free American beet growers from the anomalous but traditional dependence on European seedsmen. (The California, New Mexico, Colorado,

Minnesota, and Michigan Agricultural Experiment Stations, the Division of Soil-Fertility Investigations of the Bureau of Plant Industry, the Carbohydrate Division of the Bureau of Chemistry and Soils, and the Division of Mechanical Equipment of the Bureau of Agricultural Engineering are cooperating in this work.)

Field stations and laboratories are maintained at the following points: Twin Falls, Idaho; Riverside, California; Fort Collins, Colorado; Salt Lake City, Utah; and Rocky Ford, Colorado. Field experiments are also conducted at stations at Davis, California; Las Cruces, New Mexico; Scottsbluff, Nebraska; St. Paul, Minnesota; East Lansing, Michigan; and Logan, Utah.

2. Sugarcane Investigations.--These investigations include the study of sugarcane diseases, development of disease-control methods, and the breeding and testing of new varieties of cane to secure disease-resistant, higher-yielding commercial varieties better adapted to natural climatic and soil conditions. The sugarcane industry is particularly interested in the investigations on field methods of controlling diseases, the continued development of disease-resistant varieties looking toward minimizing the fluctuations in production due to recurring disease hazards, and in the increase and distribution of seed supplies of the improved varieties as they are developed.

The project directly serves cane producers in eight States and Puerto Rico, who utilize about 490,000 acres of land for sugar production and more than 100,000 acres for sirup production. The welfare of approximately 1,000,000 people living in these cane-producing areas is directly or indirectly dependent upon the crop. About $330,000,000 are invested in land, transportation, and milling equipment, implements, etc. Incidental service features of the activities in this project are extended to the sugar industries of the Territory of Hawaii and the Philippine Islands, which have combined capital investments of about $350,000,000. Outstanding progress has resulted from this work, the most striking example being the reconstitution of the Louisiana sugarcane industry by means of disease-resistant varieties of cane. The five-year average production of sugar reflecting the per-acre yield of cane during the period 1924-28 dropped because of a recently introduced virus disease to 95,400 tons per year, compared with an average of 280,000 tons for the previous 20 years. Restoration to an average of 200,600 tons per year for the five years 1930-1934 is directly attributable to this research, and the outlook for complete restoration and more profitable conduct of this important industry and the cane-sirup industries of the Gulf States seems dependent only on intensive prosecution of work under this appropriation. (The Puerto Rico, Louisiana, and Mississippi Agricultural Experiment Stations are cooperating in this work.)

Field stations and laboratories are maintained at the following points: Canal Point, Florida; Houma, Louisiana; Cairo, Georgia; and Guayama, Puerto Rico.

(x) TOBACCO INVESTIGATIONS

Appropriation Act, 1937	$137,744
Budget Estimate, 1938.	137,744

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)
1. Tobacco investigations:			
(a) Cigar binder and filler production investigations. . .	$5,143	$5,717	$5,717
(b) Flue-cured tobacco production investigations.	23,797	28,712	28,712
(c) Burley tobacco production investigations	7,817	9,435	9,435
(d) Maryland tobacco production investigations	6,989	6,360	6,360
(e) Dark air-cured tobacco production investigations . . .	2,242	2,400	2,400
(f) Tobacco disease investigations	55,972	52,302	52,302
(g) Breeding and growing high nicotine tobacco for use in insecticides	10,232	10,250	10,250
(h) Tobacco breeding and physiological investigations . . .	25,023	22,568	22,568
Unobligated balance	529	- -	- -
Total appropriation.	137,744	137,744	137,744

WORK UNDER THIS APPROPRIATION

Tobacco investigations include all phases of growing, curing, and handling tobacco, with the exception of tobacco insects and their control and tobacco marketing. The work consists of studies on tobacco diseases and their control, laboratory research on causes of poor quality in leaf tobacco, and field investigations in the improvement of tobacco varieties and methods of fertilization, growing, curing, and handling the different types of leaf, as each distinctive type of tobacco presents special cultural problems. Development by breeding of milder types of leaf having a reduced content of nicotine is a feature of the work, as are also the development of high nicotine tobaccos for use as raw material in the production of insecticide and the determination of the best cultural methods for maximum production of nicotine. The primary aims are to increase the average quality of the tobacco produced and to reduce the hazards and heavy losses encountered in the culture of the crop. Cooperative experiments are carried on at the agricultural experiment stations of tobacco-growing States, namely, Connecticut, Georgia, Maryland, Massachusetts, North Carolina, Pennsylvania, South Carolina, Tennessee, Virginia, West Virginia, and Wisconsin, but no independent field stations are maintained.

Correct methods of fertilization are of outstanding importance in producing high-quality tobacco, and recent changes and trends in the production and use of fertilizer materials have created urgent need for information as to the

adequacy and limitations of the newer materials in the fertilization of the different types of tobacco. Results already obtained concerning the necessity for supplementing the highly concentrated fertilizer materials with magnesium and certain other elements have strongly emphasized the importance of these problems, and the necessary information can be obtained only through extensive field and laboratory studies. It is essential also that cropping systems best suited to the production of leaf of high quality be determined. Due to the appearance of new diseases and the spread of older troubles, tobacco growers are suffering steadily increasing losses. The new blue mould or downy mildew constitutes a grave hazard over the greater portion of the tobacco-producing area, and it is especially important to further develop control measures by regulation of temperature and humidity in the seed bed. In the Burley areas, in which 500,000 acres of tobacco are grown, most growers suffer damage from the black root-rot disease. In 1933 hundreds of acres of tobacco in Pennsylvania were practically ruined by the wildfire disease. Mosaic disease is widely prevalent in Maryland and other producing areas. Although definite progress has been made in developing control measures, much additional work is required, especially on some of the newer disease problems. Increase in the available supply of nicotine for insecticidal purposes at reasonable cost appears to be a matter of special importance at the present time, especially in connection with the spray-residue problem. There is urgent need for improvement in present methods of curing to eliminate serious losses incurred with Burley and other air-cured types.

(y) WESTERN IRRIGATION AGRICULTURE

Appropriation Act, 1937	$122,527
Budget Estimate, 1938	122,527

PROJECT STATEMENT

Projects	1936	1937 (Estimated)	1938 (Estimated)
1. Crop production investigations on irrigation projects	$90,323	$90,730	$90,730
2. Quality of irrigation and drainage waters, Investigations of. .	31,738	31,797	31,797
Unobligated balance	466	- -	- -
Total appropriation	122,527	122,527	122,527

WORK UNDER THIS APPROPRIATION

General.--Under this appropriation the Bureau of Plant Industry is conducting investigations, independently and in cooperation with the States and other bureaus of the Government, in the irrigated areas of the western United States to determine what crops and what crop rotations are best suited to the several regions, what constituents and concentrations of salts in irrigation and subsoil waters are injurious to crops, and how such injury may be minimized or prevented. The work of the Division is conducted under two projects, as follows:

1. Crop Production Investigations on Irrigation Projects.--The work under this project is prosecuted at seven field stations. Six of these are conducted in cooperation with the States of Nevada, Oregon, Washington, Montana, South Dakota, and Nebraska. The work at these field stations consists of tests of varieties of field crops, an extensive and long-continued series of crop rotations, experiments in pasturing crops with livestock, and experiments in the use of manures and fertilizers. The fundamental objective of all these experiments is to determine what crops and what methods of crop production and utilization are best adapted to the respective areas and will best maintain the productivity of the irrigated lands. The field stations operated on the irrigated lands serve cooperating divisions of the Bureau of Plant Industry, as well as divisions of other Federal bureaus and research and demonstration agencies supported by the States. (Bureaus of Animal Industry, Dairy Industry, and Agricultural Engineering cooperating).

2. Quality of Irrigation and Drainage Waters.--The work under this project is conducted at two field laboratories--one at Riverside, California, and one at Fallon, Nevada. It is cooperative with the States of California and Nevada, with the Bureau of Reclamation, the Geological Survey, the International Boundary Commission (United States and Mexico), and with various irrigation districts. The investigational work consists of collecting and analyzing samples of irrigation, drainage, and underground waters to determine what constituents and what concentrations of these constituents are causing crop injury or impairing the physical condition of the soil, to determine the sources of the contamination of irrigation supplies with such highly injurious substances as the compounds of boron and chlorine, and to devise means for minimizing or preventing such contamination. The fundamental objective of these investigations is to protect and maintain the productivity of irrigated lands.

EMERGENCY FUNDS

Direct Allotments

Projects	Obligated, 1936	Estimated Obligations, 1937
Public Works Allotment (National Industrial Recovery Act):		
Spray-residue investigations:		
Conduct agronomic studies of crops which furnish non-poisonous spray materials	$2,289	$60

Projects	Obligated, 1936	Estimated Obligations, 1937
Public Works Allotment (National Industrial Recovery Act)-Continued		
Physical improvements at various field experiment stations, etc. (completion of work begun in 1934):		
Erecting irrigation system, Beltsville, Md.	- - -	2
Constructing roads and walks, Beltsville, Md.	9	- - -
Purchase of land formerly leased, Beltsville, Md.	72	1
Staff laboratory and research building equipped (all phases horticultural research), Beltsville, Md.	400	- - -
Repairing and painting buildings, Beltsville, Md.	3	- - -
Constructing three tool sheds, Beltsville, Md.	9	- - -
Digging irrigation wells, installing pumps and ditches, and reconditioning station buildings, including new heating and bath equipment, Greeley, Colo.	2,500	- - -
Repairing and oiling roads, Cheyenne, Wyo.	- - -	3
Establishment of a Federal cotton-breeding field station and seed farm in the Mississippi Delta	19,421	3,669
Construction of cold frames and hot beds, Meridian, Miss.	298	15
Construction of laboratory office building and sugarcane mill, equipped, Meridian, Miss.	105	292
Providing land, buildings, and other facilities for cotton investigation work, North Carolina	402	1,300
Providing land, buildings, and other facilities for investigational studies in cotton and cereal crops, Tennessee	4,178	339
Construction of artesian well, Newell, S. Dak.	19,500	500
Machine shed, sheep and lamb shed, buildings, and repairs, Newell, S. Dak.	- - -	27

Projects	Obligated 1936	Estimated Obligations, 1937
Public Works Allotment (National Industrial Recovery Act) - Continued		
Physical improvement at various field experiment stations, etc. - Continued.		
Construction, equipment, and operation of a fruit-products laboratory on Government-owned ground near Beltsville, Md.	$2,759	$ 274
Total, Physical improvements	49,656	6,422
Total, Public Works Allotments (N.I.R.A.)	51,945	6,482
Emergency Relief Appropriation Act of 1935:		
Reconditioning and altering the grape-production and pathological laboratory and office buildings, including the building and landscaping of roads and walks, Fresno, Calif.	4,999	- - -
Repairs and heating plant in field laboratory and implement storage building; digging deep well and constructing water distribution lines; and construction of additional storage space, Medford, Oregon.	3,426	- - -
Drilling irrigation wells; installing pumps and ditches, Greeley, Colo.	7,999	- - -
Renovating buildings; cleaning grounds; repairing fences; and renewing water pipes, Big Spring, Texas	1,031	- - -
Repairing and painting station buildings, Robson, La.	997	- - -
Clearing and leveling land and building storage shed, Willard, N. C.	503	- - -
Clearing and terracing land, installing power lines, and extension of water system and storage supply, Meridian, Miss. . . .	7,700	- - -
Renovating buildings, including repairs to foundations, patching plaster and stucco, painting, redecorating, etc., cleaning up shelterbelt and grounds; repairing roads and fences; gradingland, U.S. Dry-Land Field Station, Tucumcari, N. Mex.	2,000	- - -
Building roads and sidewalks to connect station buildings and field plots, and installing measuring weirs and irrigation system, Indio, Calif.	2,797	- - -

Project	Obligated, 1936	Estimated obligations, 1937
Emergency Relief Appropriation Act of 1935 - Continued		
Constructing a fireproof record room to keep valuable records, Indio, Calif. . .	3,495	- - -
Erecting fence to protect experimental plots from theft and stray animals; remodeling several buildings to make them more valuable for experimental work; altering and painting buildings, Indio, Calif.	4,896	- - -
Total, Emergency Relief Appropriation Act of 1935	39,843	- - -
TOTAL, All Emergency Funds (Direct Allotments)	91,788	6,482

PASSENGER-CARRYING VEHICLES

The authorization for the purchase of passenger-carrying vehicles contemplates an increase of $750 ($18,825 in 1937; $19,575 estimated for 1938) for this purpose. As shown by the Budget schedule, the $19,575 authorization would permit replacement of 28 vehicles and the purchase of 7 additional vehicles. The replacements are needed in order to obviate the continued use of worn-out cars at excessive maintenance costs.

The work of the Bureau of Plant Industry is necessarily to a very large extent in the country, where transportation through the use of automobiles is essential to effective work. Automobiles can be obtained for the purpose by hiring commercial cars, by using personally-owned cars of employees on the mileage basis, or by the purchase of Government-owned cars. The latter method has been found to be the most economical in the work of the Bureau of Plant Industry, costing on the average about 3 cents per mile for light makes of cars. The purchase of additional cars included in these estimates will reduce the use of personally-owned cars, which cost in the neighborhood of 5 cents per mile, and also the hire of commercial cars, which cost from 10 to 15 cents per mile.

All these cars will be used at points in the field incident to the conduct and supervision of experiment work. Specifically, 4 cars will be used for travel in rural regions and elsewhere as necessary in conducting cotton-improvement and disease investigations in the States of Arizona, California, North Carolina, and Texas; 2 cars will be used in connection with the shelterbelt work in the southern Great Plains area and at Mandan, North Dakota, and 2 cars for use in making trips between station and town and on station projects in the States of Kansas and Texas; 1 car to be used in connection with forage-crops investigations for transportation of men and materials in the States of Kansas,

Oklahoma, Nebraska, Colorado, Texas, New Mexico, and adjacent territory; 3 cars to be used in connection with forest pathology work in the States of Louisiana, Pennsylvania, and Oregon; 15 cars to be used in connection with the fruit and vegetable crops and diseases investigations in practically every section of the United States; 2 cars to be used in connection with plant-disease survey work and in making special trips to investigate the outbreaks of plant diseases and observations of general plant-disease conditions; 2 cars to be used in connection with sugar-plant investigational work in conveying employees and officials to experimental plots and carrying delicate instruments for field use in the States of Utah and Florida; and 4 cars to be used in connection with irrigation work on the several reclamation projects in the States of Oregon, Montana, and California.

BOUND BY